MODEL AIRPLANE NEWS

AUGUST 1956 — 35 CENTS

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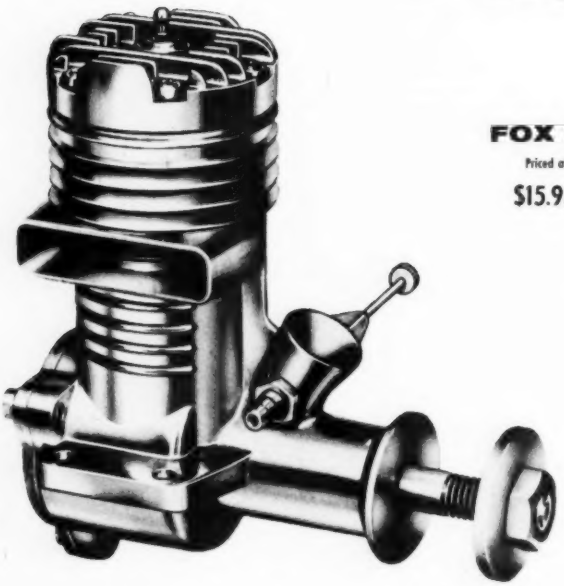
The motor that was so outstanding that national contest rules were made to fit it.



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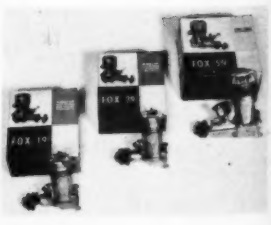

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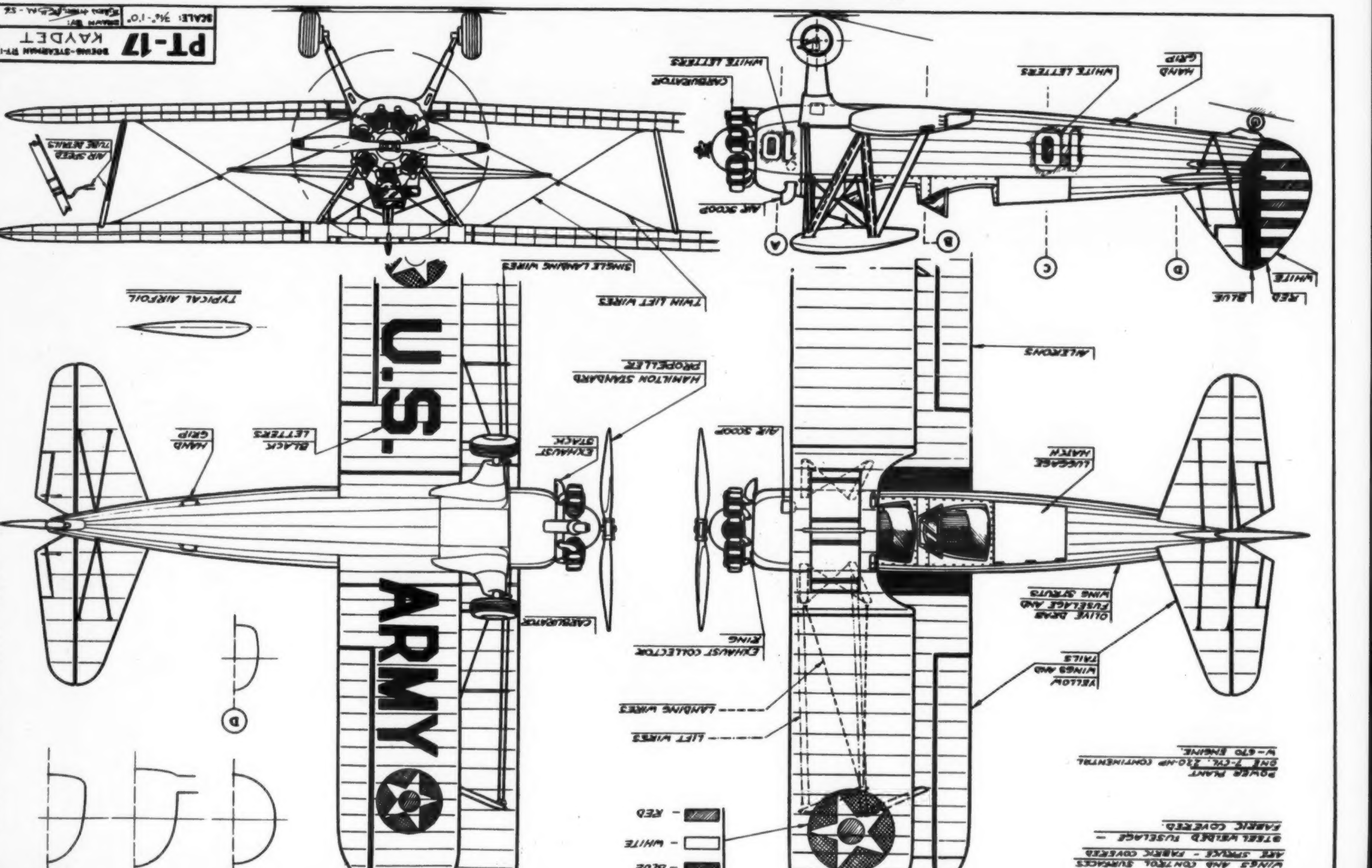

27th Year of Publication

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JAY P. CLEVELAND, President and Publisher

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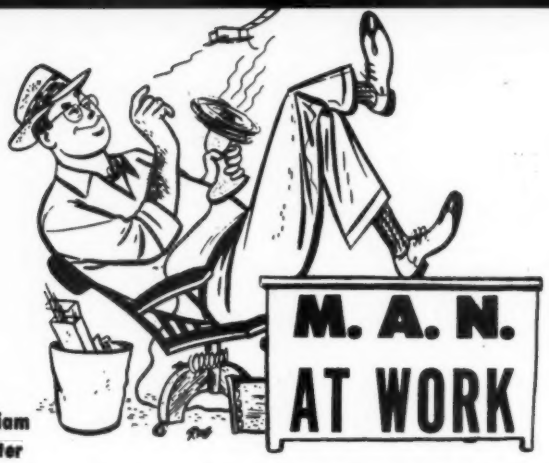

by William Winter

► Basically, there is nothing to flying a model airplane. You wind it up and let it go. But bring two guys together to prove whose model is the better, and life is complicated. You gotta have rules. Right now, the whole modeling world is jawing about rules. Internationally, the brickbats are flying over the FAI debacle. Here at home, in a rules-making year, the signed petitions, mimeographed blasts, and dear-sir-you-cur letters, create an acute shortage of soap boxes. It might be fun (?) therefore to consider the sad lot of the Chairman of the AMA Contest Board, Claude McCullough.

Mac is an easy-going guy who has flown the hottest of free flights since before the war, as well as radio control. But to some people, he's a villian. The 1955 Board Report had as its principal purpose the promotion of discussion of rules, to start the pot boiling. The first letter received by the hapless chairman was a 9-page affair calling the report "a bunch of soft soap designed to make the modelers think they had something to do about the rules" and it went on from there. The next letter called the intrepid Iowa farmer "a captive of the internationalists." Poor Mac was beginning to think he would be lynched before he could get to the Nationals. The possibility that Mac might be so honored before MAN at WORK inspires us to let in a little fresh air.

From the proposals sent in by the modelers, the Board Members, and the Rules Advisory Committees, a preliminary ballot is prepared by the Chairman and submitted to the Board for a vote. This is an elimination vote—poorly supported proposals are dropped to make the final ballot of reasonable size. When a proposal is made to change a rule, choice is provided to vote for retaining the rule. Sounds peaceful, but. . . .

• • •

► Ron St. Jean, of Ram Rod fame (and Paul Gilliam says the Ram Rod is better than a Civy Boy!), a great admirer of McCullough's wild shirts, really went after the let's-make-these-things-heavier boys in his pitch to the Chairman. "Have heard a lot of screaming for 150 ounces power loading," says Ron, while calling the whole business ridiculous. Ron says, retain the 100-ounce loading—better yet, dispose of power loading altogether. Since disposing of the wing loading rules after the war worked out so favorably, maybe Ron has (*Continued on page 7*)

NEXT MONTH'S COVER

SOPWITH TRIPLANE

PLANE ON THE COVER

Supersonic in level flight, the Super Sabre, North American's F-100, here is strikingly depicted by cover artist, Jo Ketula. Capable of at least 760 mph with afterburner operating, the swift Sabre is used as a fighter and fighter bomber. Service ceiling over 50,000 ft. Drag chute slows it down after landing to reduce ground roll.

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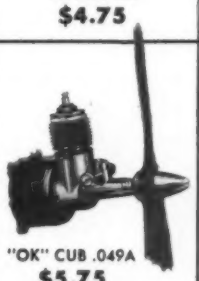

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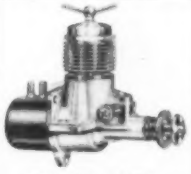

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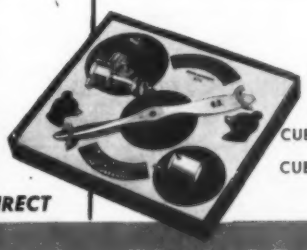

"OK" COMBINATION PACKAGES

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HERKIMER TOOL & MODEL WORKS

88 HARTER ST. HERKIMER, N. Y.

MAN at Work

(*Continued from page 2*)

something! You can build these things lighter? To the fox holes! He has other ideas, too.

Reduce the number of categories to three from four ("after competing in four events in one day, the builder is ready for a month in the rest home"); outlaw VTO take-offs for ROW models ("someday that fellow with the three balloons on the back of his job is going to figure out how to pop them when airborne"); throw cut the 3-points-on-ground take-off rule ("with one point or 20, there is no advantage or disadvantage in flight time"). Under present rules, Ron states that optimum wing areas are 200-250 sq. in. in Half A; 500-600, for a .19-.23; 600-750, for .29-.35. If the loadings were upped, these areas would be, respectively: 300-350, 600-750, 850-1,100. After wing-loading rules were abandoned 10 years ago, power loadings were raised from 80 to 100 ounces per cu. in., which made the big .60 a dead duck. Recall those 1,000 to 1,300 sq. in. monsters and you'll see why! Hard to build and transport and what a balsa bill! So Ron thinks a 150-ounce power loading would kill off the .29's and .35's. (His solution: cut the motor run and maximum flight times.) New free flight kits will not be forthcoming, forcing the beginner into original designs in order to compete. Present kits would be "heavy" wing-loading jobs. Without power loading rules, we could expect to see some .23 powered 350 sq. in. jobs.

"The reason I am concerned with the manufacturer's point of view," he states, "is because the hobby is dependent on them, and therefore their position should be considered." This point is incontestable.

• • •

► The years 1918-1927 have often been called the dark years of aviation. One of the greatest of all air stories involved the first transcontinental run of the air mail DH-4's. Unfortunately, the story cannot be told here, but the future of the air mail hung on a dramatic achievement of that great pilot, Jack Knight, to get a DH-4 from North Platte to Omaha. Without aides, and in the foulest weather, he had to push the open cockpit job on through to Chicago. His plane was the only one available for the hop to New York. Remember reading somewhere that the old DH's suffered 400-odd forced landings in a year. Those guys didn't even have carburetor heating. The Grave Yard of the Alleghenies—who remembers? Which brings us to the Air Mail Pioneers, an association of all personnel employed by the U. S. P.O. Air Mail Service. This wonderful group was formed in 1953 at Cheyenne by 66 members, who then started nine chapters. Today, there are 565 members. At the Chicago Chapter meeting in 1954, the Tree Town Modelaires displayed 12 models for the admiring old times.

As Clarence Stewart, National Secretary of the A.M.P., relates, ". . . all had a hand in blazing the air mail from coast to coast, improving by trial and error, during the years that aviation needed a friend . . . when the pioneers had to prove to a skeptical public that the airplane could be used to speed the mails." In those days, they didn't cancel flights! A mail man was supposed to deliver letters—rain, snow, or shine—and that, too, was expected of the stick-and-wire crates. (Air Mail Pioneers, East Lake and Indiana Ave., Elmhurst. Ill.).

• • •

► "When the only rules in speed, (other than those defining classes and measurements of speed) are safety rules, it looks downright dangerous that we are using a pull-test standard which, instead of providing a margin of safety, actually applies but 90% of flight stress." This disconcerting blast from Charles Klabunde, Physics Department, University of Illinois, who flies merrily on, "This ostrich-headedness we modelers exhibit is a serious breach of our AMA pledge to fly safely and should be corrected pronto."

Klabunde attaches a sheet of figures proving that the pull-test should be 30G's, and sends another letter to that villian, McCullough. If this is true, how about that AMA insurance?

• • •

► Man bites dog. When modelers used a ball field more than the players in Reading, Pa., the Reading Aero Modelers Association (started by Flying Mustangs) not only asked for it, but said how about four macadam circles for U-control. The city cooperated and, through the Reading Recreation Department, provided meeting places in field houses. Have 25 members, show Air Force movies, run building classes for beginners. (Joe Nawrocki, Reading Aeromodelers Assoc., 314 Noble St.) . . . Atlantic City Convention Hall may look like just that to politicians, but to South Jersey Modelers, it has room for 9 flying circles. Southern New Jersey Associated Modelers hope to have a control-line meet there next winter. (Those Polar Bears must be turning sissy!)

George Moir, who sends this tidbit, also makes an aside comment about new featherweight Team Racer made of Styrafoam. Can be planed, sanded, gouged, sawed in paper-thin wafers, just in case you are hungry . . . Junction City, Kan. model flying site has circles full of pebbles, sand, and weeds—also a wild west sign: No Horses or Cars Permitted on the Fying Area. So says, Charles O'Donnell, a soldier at Fort Riley, Kansas, who longs to get back to his Jersey modeling . . . it's no longer Jasco, but Jetco Models. Time marches on . . . Midwest Model Aircraft News, a 10-page club paper (Nobby Hobby Shop, 10310 Union Ave., Cleveland 5, Ohio), is a good 'un.

• • •

► Hear that our friend of many past Nats, Harry McCall, a Cleveland dealer, is moving to California. Bet the American Airlines Club will miss him. This outfit has always helped judge, or run, every big event in Cleveland, from the National Model Plan Show, each February at the Higbee Co., to the Junior Air Races, held by the Cleveland Press, and the annual indoor event held each spring at the Public Auditorium . . . Sage advice from Cuba's Tony Allvarado, who says we still can't spell the plural of senora, to wit, "Reading Report on Germany, came across author's surprise at finding 'swept wings' translated into 'arrow shaped.' To me the English 'swept wings' evokes a picture of a poor GI airman with a broom, sweeping endless wings until they shine."

• • •

► Why do we mention clubs? Warren Warner, Lubbock, Texas, says Texas Eagles picked up six new members, who suffered through recent MAN at Work. Despite 30-40 mile winds. held a combat contest. Twenty-one guys braved the breeze but broke up 16 planes. That's combat! . . . In March, we asked about the Zanonia "leaf." From Israel comes the answer. Naftali Kadmon, says it is a seed, not a leaf, of the Zanonia macrocarpa, that has a peculiar stable flight. Friend of his Dr. M. Sultan, Tel-Aviv, made such

(*Continued on page 52*)

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The Blackburn Monoplane

By PAUL E. DEL GATTO

Forty-four years after it was built this ancient craft is still flying in England. Model flies on .049's.

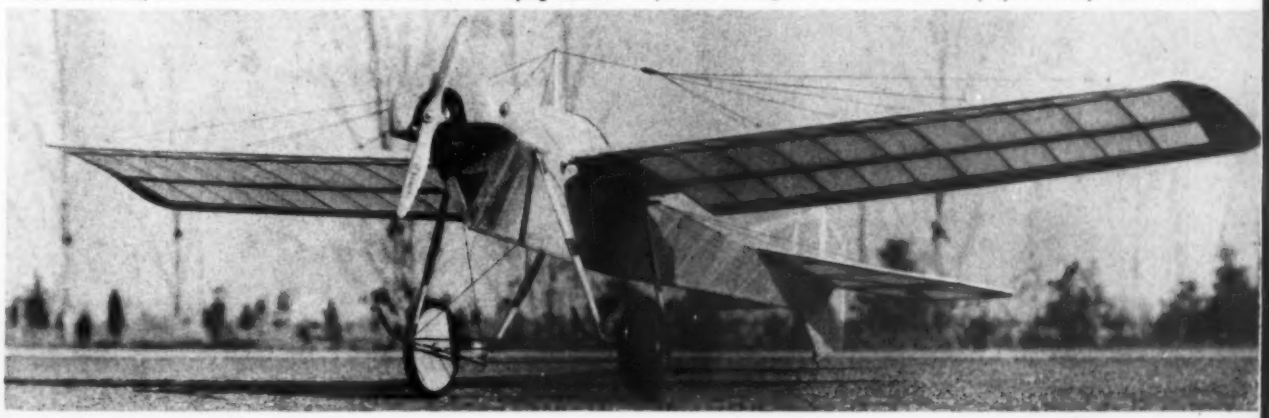
Flipping the prop of the miniature Blackburn, the author prepares the valiant oldtimer for a take-off. Home-made wheels add to its authenticity.

THIS model Blackburn is a copy of one of the three oldest airplanes in England still in flying condition. We had read of its flying activities as late as December of 1951.

In that year, the Blackburn Monoplane was flown at Hendon in the "Fifty Years of Aviation" display. The flights were short to help preserve its 50 HP seven-cylinder Gnome rotary engine.

The rudder and elevator controls consisted of a conventional rudder bar and joystick. Lateral control was obtained by warping the wing trailing edge with the aid of cables, standard technique at the time the plane was built. When we read of this fabulous old timer back in 1951, we made up our mind right then that we would soon build an exact scale replica. Our only important deviations from the original airplane were its size, the materials, and the engine. Even the type of structure and positions of structural members were retained.

Struts and wires, wires and struts! Lower wires left off for flying because of possible damage from weeds. Skids employed to stop nose-overs.



Delicate, birdlike grace of the old-time monoplanes is captured by this excellent flying model. Biplanes were kingpin, though, for many years.

Test flying the model proved to be doubly satisfying for she was gentle as a kitten to handle. Watching it in flight was fascinating. With power on, the old timer flew smoothly and made a graceful transition into the glide when the engine cut. Its performance became more impressive as flight after flight was logged, for here was a design that had been conceived some 44 years ago, flying as well or better than most of the scale models evolved from more modern designs.

Of course this may seem like an unjust comparsion when you realize the tremendous difference in the requirements of an airplane of today as compared to those of that era. Yet it is a comparison that you can't help but make. Constructing the model is very much like building that hot free-flight design. Basic construction will be clearly understood from the plan. We should highlight some of the important features.

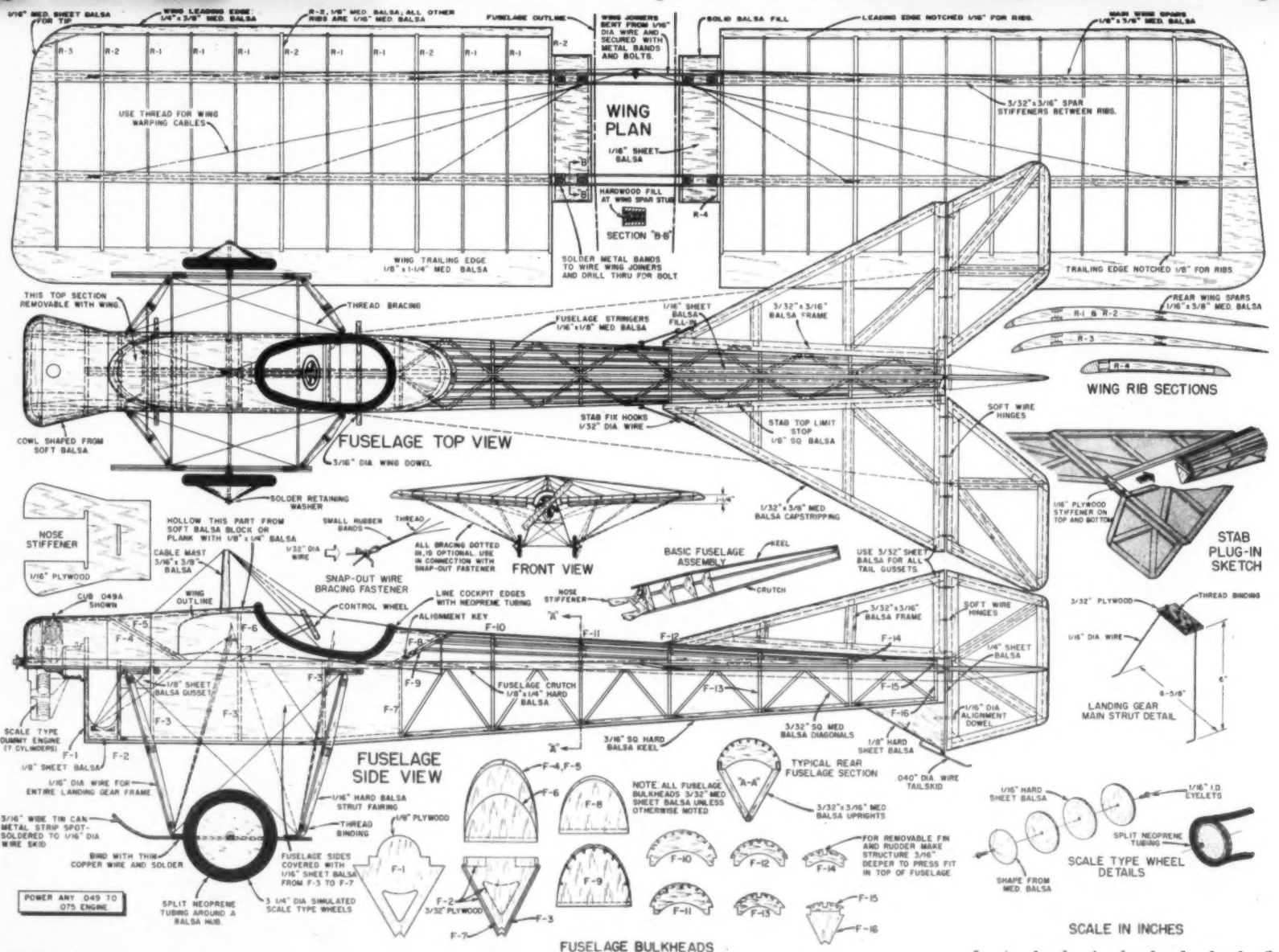
Beginning with the fuselage, the first point of interest is that the basic structure begins with a crutch to which the formers, keels, and other structural members are added. The landing gear assembly is a faithful reproduction of the original, down to the light-weight scale-type wheels, which we highly recommend to minimize weight.

The tail assembly structure is an exact copy of the original, including the simulated fabric seams obtained by using 1/32" x 3/8" capstripping. These catstrips also have the double function of minimizing warps.

As can be observed in the plan, the stabilizer assembly is plugged into the rear of the fuselage and then secured at the leading edge with small rubber bands. The fin and rudder assembly press fit into a recess in the top of the fuselage and the rudder is kept perfectly aligned with a dowel peg keyed into the sub-rudder. The leading edge of the fin can be held down with the same rubber bands that secure the stabilizer leading edge.

The wing structure utilizes the identical full-scale rib locations, in addition to taking advantage of the scale airfoil cross-section. (*Continued on page* 48)

Early airplanes were little more than over-sized models, so their proportions are excellent for modeling. Suggestion: How about a dummy pilot?



PDG

FULL SIZE PLANS AVAILABLE. SEE PAGE 58.

Under the RED SHIELD

There is no substitute for personal instruction. Unfortunately, lack of suitable kits for the beginner is handicap to all such programs. Any "bug" that shows up in kit results in confusion.

By JIM THRIFT

Through their Red Shield Boys Club in Winston-Salem, N.C., the Salvation Army operated for 16 years a wonderful idea.

THE Red Shield Boys' Club here, in Winston-Salem, N. C., is a wonderful success story. In 16 years, the club grew from a small group in the basement of the Salvation Army citadel to close to a thousand members in our beautiful new building. Many of these are model airplane hobbyists who attend our classes.

We can't cite a long list of champions in model aviation that have come from these classes. We simply try to train boys to work together in harmony and to use their minds and hands creatively. In this, model aviation excels all other craft work.

We use the wood-working shop area which is fairly well isolated from the hub-bub of the rest of the club's activities. Exclusively for modeling classes is a locker and supply room adjacent to the shop room. The lockers are of two sizes. For the advanced builders, 36″ x 40″ x 21″; for the beginners, 28″ x 36″ x 10″. These lockers allow enough room for a Cellotex or like-material board on which the boys build their planes. At the conclusion of the class period, the boys simply gather up their work from their individual benches, and place it on their respective boards, and put it back in their assigned lockers. This system works well in that any work pinned down to dry or set need not be disturbed, and the boy can take up where he left off, when he returns at the next session.

At present, we have 21 lockers for advanced boys, and 30 for beginners. The especially designed cabinets provide ample space for plenty of tools, wood in a variety of sizes, all kinds of parts, paper, glue, dope, plans, etc.

The method of instruction is the result of years of trial and error. One of the first problems was the absence of

Installing a prop on simple ROG (Rise-Off-Ground) model. Boys prefer quick-building model that looks like it will fly. It must fly.

Here checking alignment on Jasco Trooper glider, boys display cooperation that is a goal of this program. Quickie kits are taboo.

Ability to handle a built-up framework is a must for any modeler worth his salt. With wax paper over Jasco Hawk plans, this chap lays out a fuselage side. Kits can't be hard either.

Boys allowed to bring in their own work, too, if they can handle the job! This one looks OK.

kits for the beginner. In working with large groups, problems increase in proportion to the number of difficulties encountered by the individual. You come to abhor any "bug" which shows up in a kit. So, in order to give any appreciable amount of individual guidance and instruction, these difficulties must be held to a minimum.

A boy desires three things: to build a model quickly with as little difficulty as possible, he wants it to look like something that flies, and he wants it to fly. The lack of any of these qualities will discourage him. If he quits in disgust, that is the end of his association with model planes.

It is necessary to hold a boy's interest as long as possible. Some boys quit with the fiist model. The majority build 4 or 6, and some spend years in the classes. We make it as interesting as we can without babying, then leave the rest entirely up to him. Many become very proficient with a genuine love for modeling.

The war years were critical. Good kits were extremely hard to find. In desperation, a whole series of models were designed, from which we made our own kits. The results were gratifying. Since then, we have not been able to serve all the boys who want to build model planes. Close to a hundred boys always are on our waiting list. Even today, with the great number of kits on the market, we still use the beginners' kits that were designed in 1944.

We try to keep up with the trend and examine new kits for our program. Economy is important. Everything the boy uses to build his planes, including the kit, is furnished free to him except glue, motors, tanks, and fancy extras. Required of him is good attendance, good conduct, and interest in his work. Our cost is between 15c and 20c per boy, per night.

Quickie kits are taboo. First, they will run our cost too high, and second, they offer no challenge in construction. Nor do we select kits with intricate parts so they will consume much time. In other words, a kit is selected that we think will inspire the boy to follow through completely. To do otherwise would result in skeletons of unfinished planes and an abnormal (*Continued on page* 49)

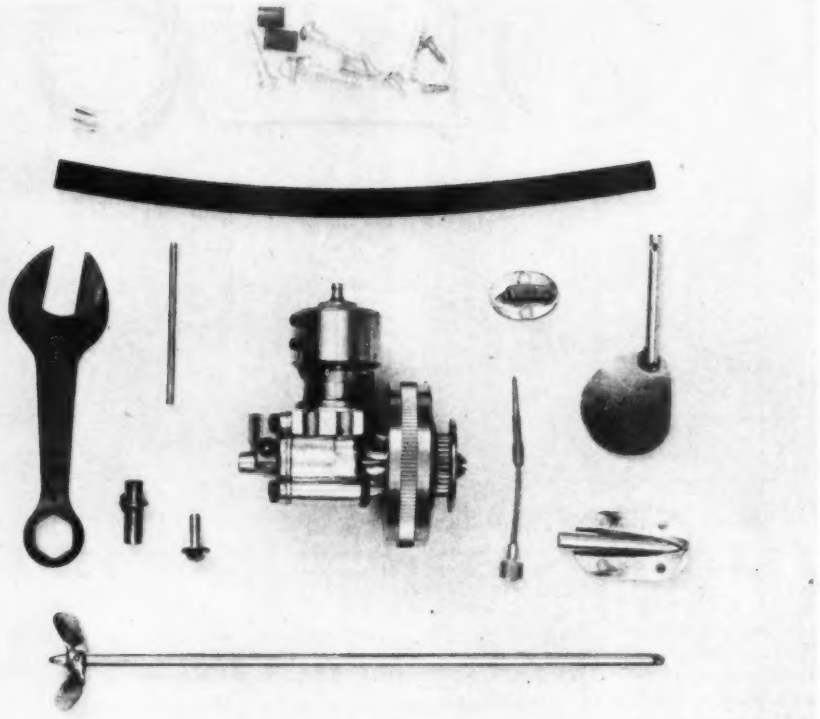
Most programs suffer from lack of everything—money, facilities, encouragement. Individual lockers, supply closets, nice area, here.

Lockers in two sizes fit individual work boards which can be put away with job intact, ready for the next session. Boys clean up!

MARINE ENGINES REVIEWED

By P. G. F. CHINN

You may never build a boat but anyone interested in engines will value this great round-up of nautical types.



Because modelers are not as well versed in marine parts performance as they are with airplane items, one big need is a complete package. Brilliant answer is O & R Mariner with its hardware.

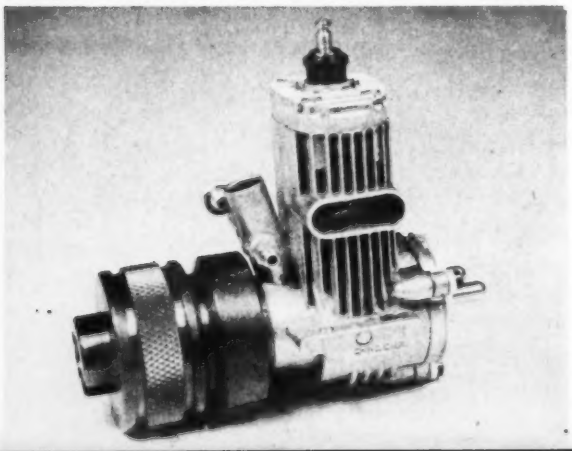
OUR purpose here is to review the present position regarding model marine motors. We should make clear from the outset that, by *marine* models, we mean engines which are intended primarily or solely for model boat work. It is necessary to draw this dividing line because, in some cases, model airplane engines are advertised as being for "airplanes, boats and cars" and while some of them, in certain types of applications (for example, open installations in racing hydroplane hulls) can be entirely satisfactory, the special marine models have been designed or adapted to cope with the operating conditions peculiar to model boats and, therefore, may be expected to give the most satisfactory service.

Excepting the case of the racing hydroplane which can, by its high forward speed, provide an adequate cooling airstream for a lightweight aircraft motor, model boat applications are generally such that the ideal marine motor is bound to differ somewhat from accepted model aircraft engine practice.

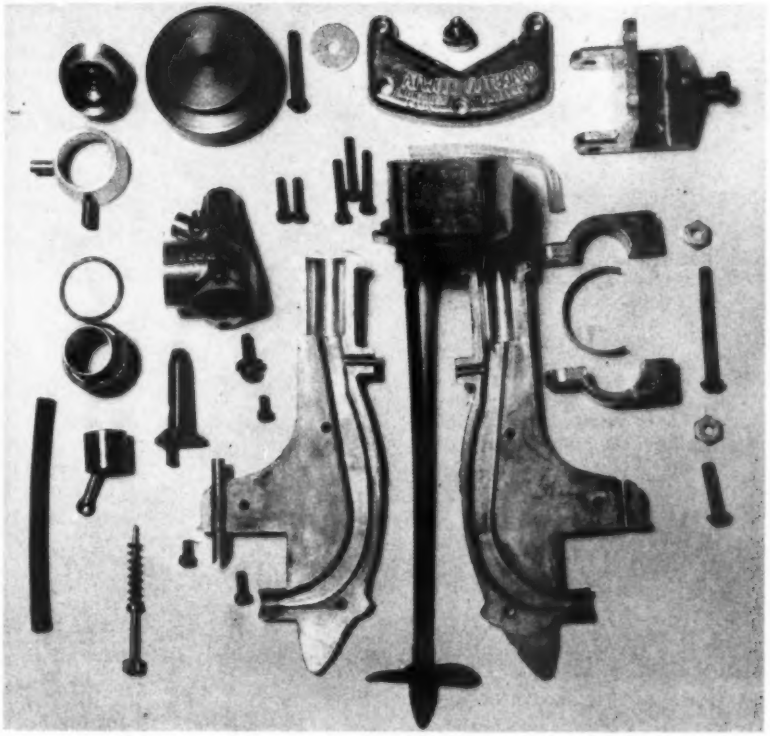
The basic differences between marine and aircraft engine requirements are bound up in the conflicting demands of cooling and weight reduction. Apart from limits imposed by requirements of physical strength and rigidity, weight saving by reducing material sections invariably carries with it the risk of overheating. Overheating is relative and is not indicated solely by an engine seizing up. It can be present in a less obvious degree, giving rise to loss of power and excessive wear due to charge pre-expansion, thermal distortion and undue variation in running clearances.

The model aircraft engine designer is fortunate in that he has a ready-made cooling system in the shape of the prop, which provides a highly effective cooling blast of air. Convenient, too, is the fact that in most cases where very high outputs and the rapid dissipation of heat is required (for example, speed models) airspeeds are cor-

The American Cameron .09 Special Marine engine illustrates the advantages of designing a powerplant expressly for the one purpose.



Sturdy construction of the Cameron .09 Marine is evident on examination of components. Watercooled case. No over-rev on no-load.



Photograph of stripped Atwood Outboard clearly shows flexible driveshaft channels in lower housing. This is an .049. Do not underestimate power, because your RC boat will be flying fish.

Ingenuity demonstrated by working outboards. Shown is the Atwood watercooled .049 model.

respondingly high. Nevertheless, it will be noted that the most successful racing engines contain a somewhat greater volume of metal than those motors required for less exacting work, resulting in weight increases to the order of 20-30 percent.

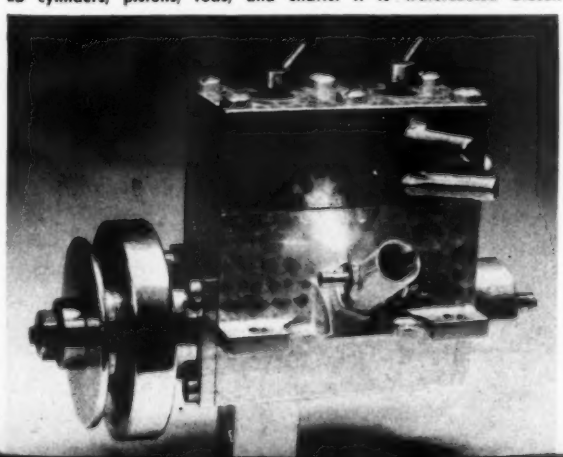
On the other hand, the designer of a model marine motor, intended for enclosed, or partly enclosed installation, must make provision for the adequate dissipation of engine heat without forced air cooling, but, happily, he is not hamstrung by the needs of weight saving. For all but record class hydroplanes which, as we have seen, can best use existing big racing motors as developed for aircraft and car work, such as the McCoy Red Heads, the average model boat engine, without flywheels, can quite acceptably scale double the weight of an equivalent displacement aircraft motor.

This is where we find the real differences between the ideal aircraft engine and the ideal boat motor design. The latter will have a greater volume of metal in the proximity of all sources of heat, whether generated primarily by combustion or friction, and efforts will also be made to stiffen any section prone to distortion. Additionally, to deal with totally enclosed installations, water-cooling may be added.

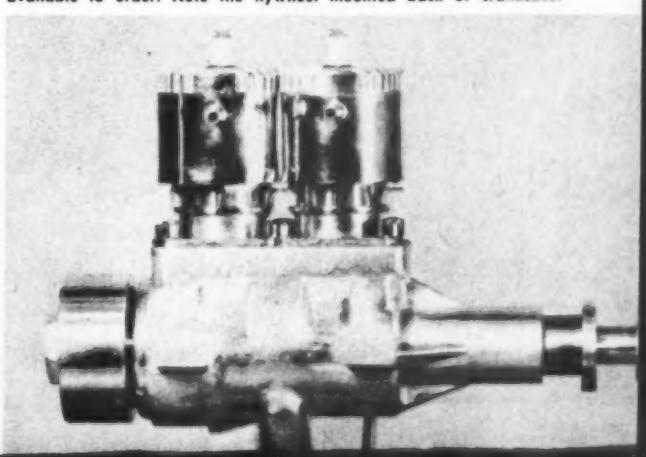
Water-cooling can, in fact, largely solve the problem of converting aircraft engines to marine use and this is the expedient which has been widely adopted by European manufacturers. For example, there are, at this writing, some fifteen different types of watercooled motors available from British manufacturers alone, all of which are simple adaptions of existing model aircraft Diesels. In addition, one London hobby house offers water-jackets and flywheels to convert most of the popular size motors, including those types, such as the Mills, of which the manufacturers concerned do not make special marine versions.

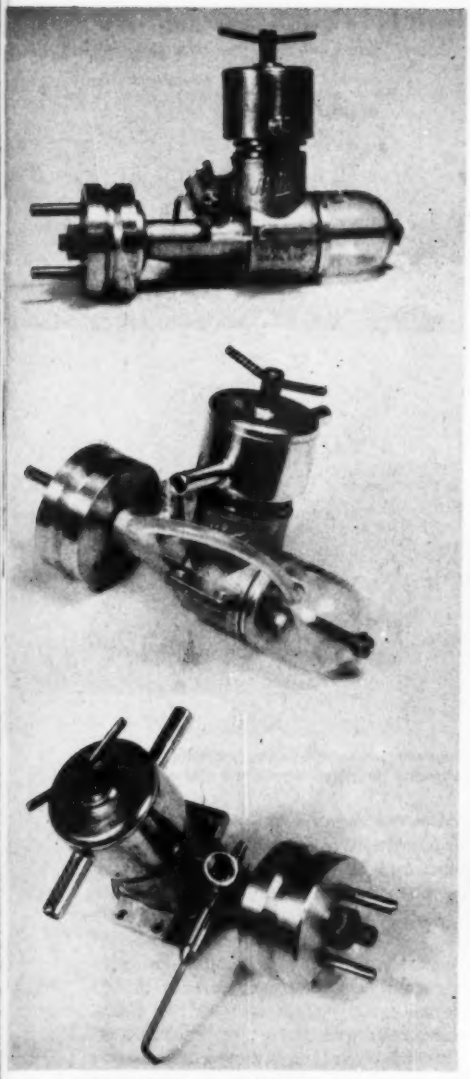
(*Continued on page* 16)

Swedish .30 alternate-firing twin by Gunnar Soderberg uses stock ED cylinders, pistons, rods, and shafts. It is watercooled Diesel.

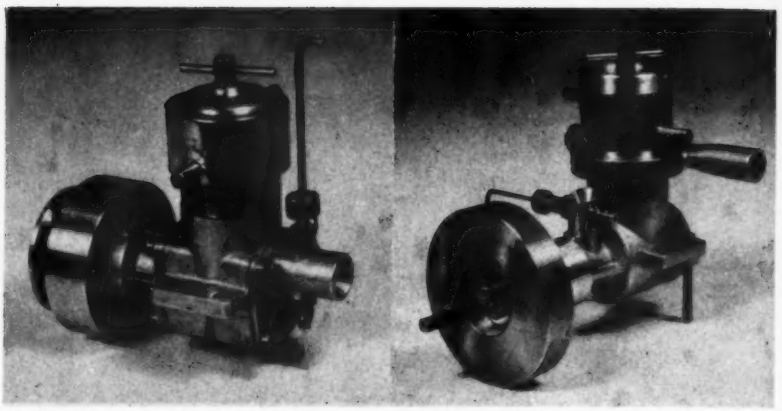


Big stuff. PAL 55M a .55 watercooled vertical twin. Spark ignition available to order. Note the flywheel mounted back of crankcase.



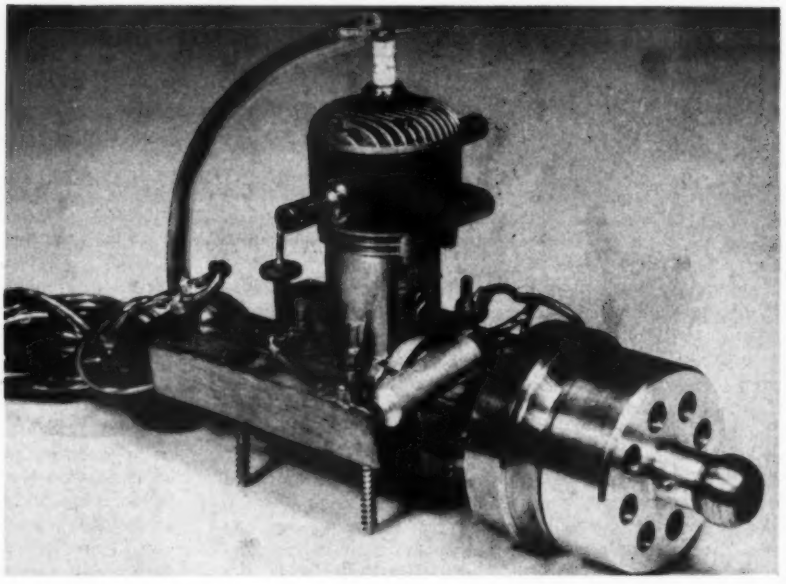


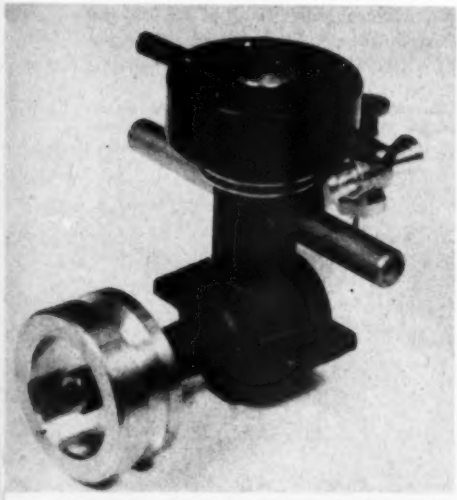
Allbon Diesel range includes, T to B—an .03 Dart, the .06 Spitfire, and the .09 Javelin.



Powerful Mach 1 Marine Diesel, from Germany (left) is well suited to fast hydroplane use. Dutch Typhoon R.250 (right) has nicely made water jacket, exhaust collector ring. Pins on the flywheel.

Author's Forster .29 converted to marine use has water jacket added, two-speed ignition, and a centrifugal clutch. Two-speed ignition offers precise, reliable throttle control, and fuel economy.





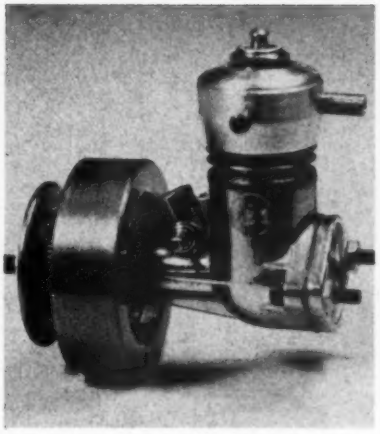
Ye goode olde Mills incognito, thanks to Rip-Max conversion, .045. Extended brass stacks.

This is in marked contrast to the situation in the United States, where currently available marine motors are of a much more varied and specialized design and, in some cases, differ widely from standard aircraft engines. In general, the European watercooled jobs are entirely satisfactory, but it is necessary to remember that they are, virtually without exception, of the Diesel type. In their aircraft versions, most of these Diesels have a separate, finned cylinder barrel encasing the upper section of a relatively heavy liner and it is a simple matter to replace the aircooled barrel with a water-jacket.

Theoretically, the engine which depends solely on a water-jacket cylinder suffers a disadvantage in that it will soon overheat if run with the boat out of the water. In practice, however, we have not found this to be a serious handicap. Starting from cold, about twenty seconds is allowed in which to make the necessary compression and mixture adjustments before the craft is launched and the temperature then reached is about correct and will be maintained by the cooling system if the "plumbing" is correct.

At this point we should also mention that the water circulation system normally used does not employ water scoops which depend on the movement of the hull through the water. Instead. a pickup tube is located closely behind the upper prop blade, in the manner used by the Atwood Outboard, and, in this way, prolonged tests or adjustments can be made with the boat stationary provided that the prop remains submerged. In most cases we have found that water cooling works well with European Diesels and provides long, even runs with none of the tendency to overheat and lose power

Bulky water-jacket on .15 ED Diesel replaces normal dural fins. Standard air cooled head.



Atwood's water-cooled inboard Half A motor. This engine is fine for small cabin cruisers.

K & B Allyn Sea Fury Outboard looks just like the real thing. Prop drive is by bevel gears.

which characterizes some of these motors when aircooled.

Currently available domestic products range from the Half-A class units produced by O & R (Cheminol Corp.), Atwood and Allyn to the big twin and four-cylinder models offered by Pal Engineering.

One of the most impressive of American model marine motors, from the technical and engineering standpoint, is the Cameron .09 Marine Special. This motor was not developed from an aircraft engine design and the results of the free hand, which the designer has been able to exercise in the structural layout, are most gratifying.

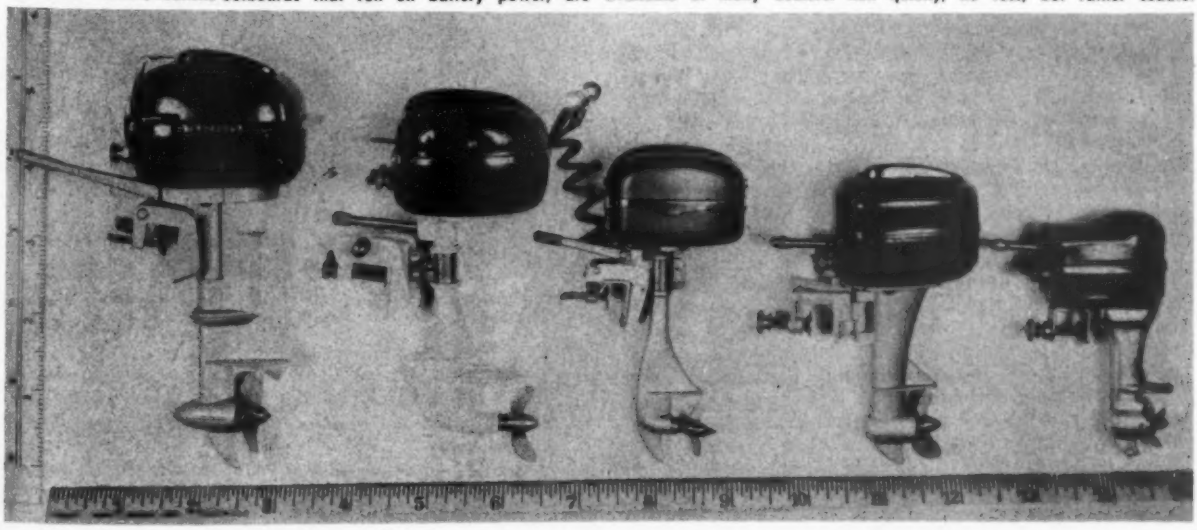
For example, the cylinder liner has an outside diameter of 11/32 in. and since the bore is only .492 in., it will be observed that the wall thickness is therefore more than 3/32 in. This liner is finely finished and is an excellent drop fit in the aluminum cylinder barrel in which it is accurately located axially and vertically. A main bearing of sintered iron is utilized to provide improved lubrication characteristics. This bearing has a wall thickness of no less than 1/8 in., plus a further 7/64 in. of housing, to support and cool a 1/4 in. diameter shaft journal. The rapid cooling and efficient lubrication provided by such a bearing permits a relatively small bearing clearance and in conducive to a long useful life and clean, smooth running.

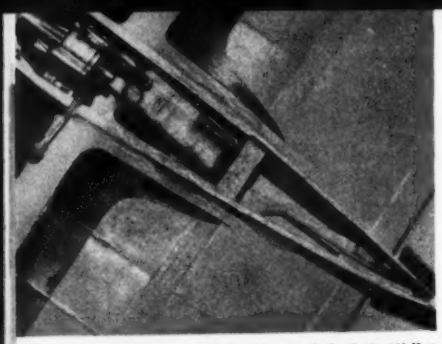
Externally, the most unusual feature about the Cameron Marine is its water-cooled crankcase. In this, water circulates through a hollow backplate unit having a capacity of about 0.2 cu. in. It consists of a normal type recessed back cover and an aluminum cover plate with suitable inlet and outlet connections. A metallic gasket is used to unite the assembly to the crankcase and assist heat transfer. No cylinder waterjacket is used; instead the cylinder has vertical cooling fins on each side which radiate part of the heat and conduct the remainder down to the crankcase to be dispersed by the cooling water. This might be called primary and secondary cooling systems.

This layout has two advantages over the cylinder water jacket. Firstly, because the primary cooling is by simple radiation, it is practicable to run and adjust the engine at some length with the boat out of the water. (Safe no-load operation is permitted under these conditions by the governing effect of the porting which we shall mention in a moment.) Secondly, in installations where the power unit is not entirely enclosed and a cooling stream of air will be received by the cylinder, the water-cooling system may be safely omitted. There are also one or two incidental advantages over the usual sealed water-jacket, such as the ease with which the water-cooling unit may be dismantled and cleaned.

A further deviation from standard model aircraft engine practice is the governing effect on no-load rpm which has been im- (*Continued on page* 59)

For smaller boats, realistic outboards that run on battery power, are available at many dealers. Run quietly, no fuss, but rather sedate.





Installation of the inverted O & R Midjet and the Sullivan nylon tank. Is compact.

DRAGGIN'

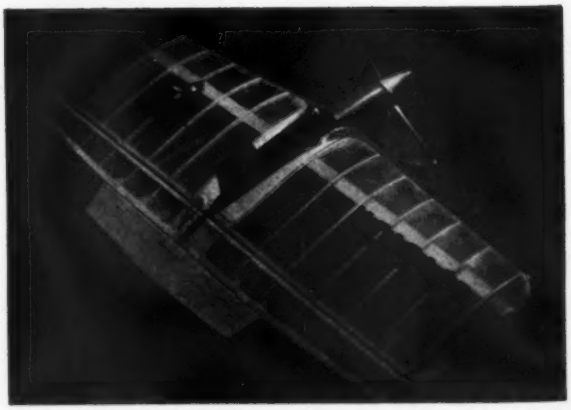
By JERRY PECK

Good small-engined stunt ships are a rarity these days. With O & R Midjet up front this little terror turns on a dime.

HERE'S a jolly little flying wing that's fun to build, fun to fly, and easy on the eyes too. Besides the unusual appearance there are some interesting new construction techniques which not only make building the *Draggin'* more pleasurable, but make it an extremely sturdy model as well.

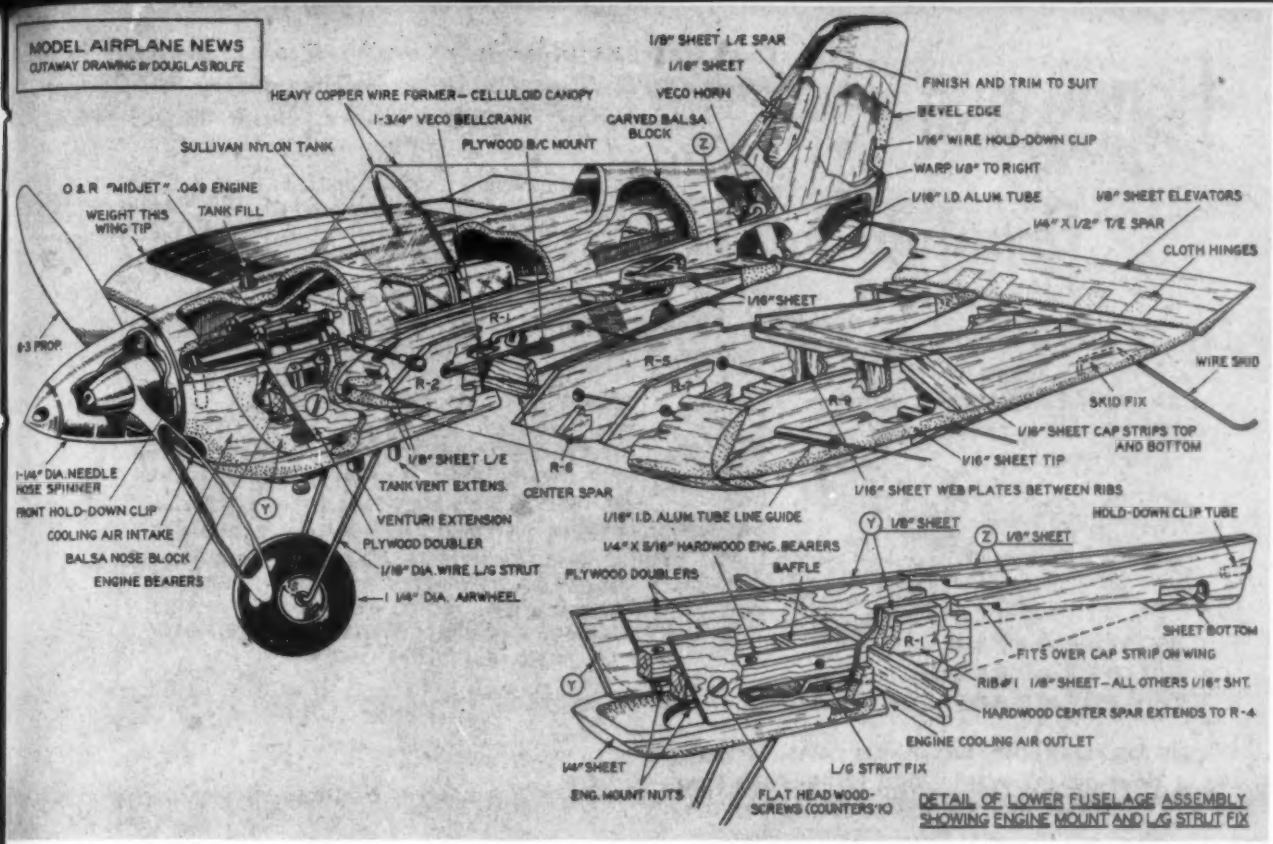
The design history goes back about five years. While transporting the remains of a conventional Half A ukie back to the shop, it occurred to me that a flying wing would offer several advantages over the usual layout. It would be more maneuverable, and a saving in weight could be realized by the elimination of the fuselage and tail section. Furthermore, the compactness of a flying wing would make it less susceptible to damage. These theories, a start at building one version, and many, many sketches made in add moments finally culminated in the *Draggin' I* airplane, a photo of which is shown.

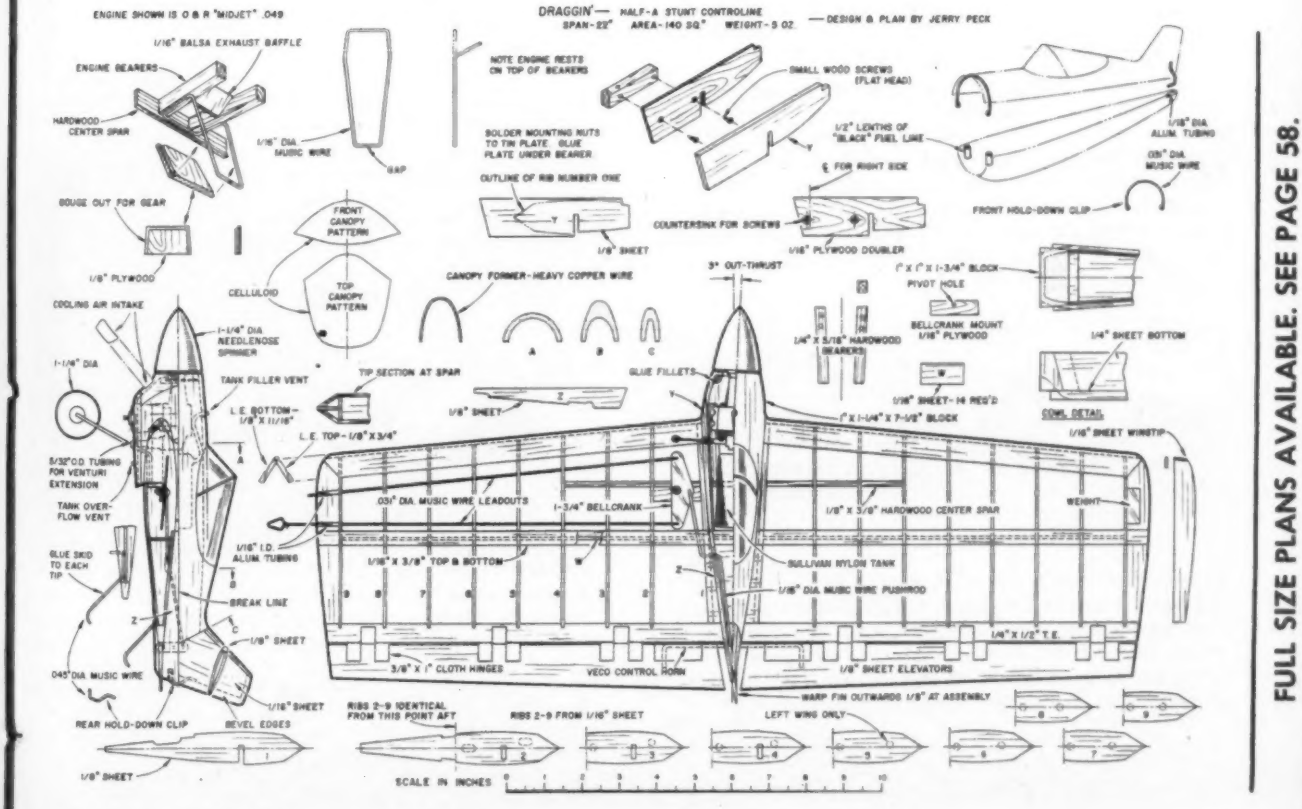
While the performance of the first version demonstrated that the basic design was good, room for improvement was indicated in a couple of places. The most important of these were centered around the engine. For some reason, possibly the popularity of radial mounting, the most common weakness of the Half A controlliner is the engine mounting system. *Draggin' I* used an extra strong radial mount, together with plywood doublers, but it too gave out. Use of beam mounts, held to plywood fuselage doublers by wood screws and much glue, has positively corrected this weakness. The other item of importance concerning the engine is to use a good fuel system, i.e., a high fuel-draw type engine and a reliable tank. Of the many units which fill this bill, I chose the O & R .049 Midjet hooked to a Sullivan nylon tank which is lightweight and incorporates internal baffles.



Final version, top, differs from earlier version shown just above. Articulated elevator was discarded as was radial mounting of motor.

The first *Draggin'* used a split elevator, the aft part of which deflected more than the forward part, giving an approximate arc of a circle, but (*Continued on page* 52)





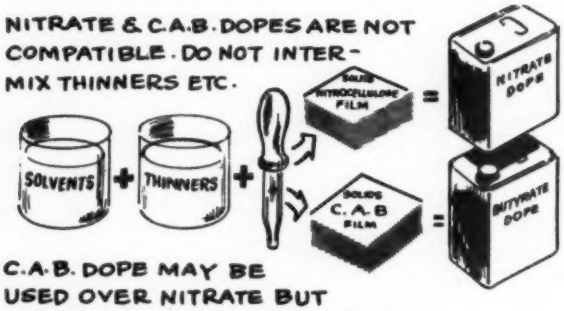
FULL SIZE PLANS AVAILABLE. SEE PAGE 58.

Dopes and Brushes

To be a successful modeler you have to use properly both dopes and brushes. Old balsa butcher, Harry Williamson, and modeler-artist Bob Godden, show useful tricks.

► Dope, and certainly the humble brush, is taken for granted. Yet few experts really know what they should about this simple subject. How else can you explain the many thousands of hopelessly warped airplanes? And even a slight warp can be a built-in crack-up. Thick dope, thin dope, plasticized dope, butyrate, nitrate, fuelproof, non-fuelproof. Brush hairs falling. Stiff brushes. Blushing. These are typical ABC's well worth reviewing.

NITRATE & C.A.B. DOPES ARE NOT COMPATIBLE. DO NOT INTERMIX THINNERS ETC.



C.A.B. DOPE MAY BE USED OVER NITRATE BUT NEVER PUT NITRATE OVER C.A.B.

C.A.B. (CELLULOSE ACETATE BUTYRATE) IS HOT FUEL PROOF—NITRATE IS NOT! IF BOTH TYPES OF DOPE ARE BEING USED WITH SAME BRUSHES, CLEAN & DRY THEM THOROUGHLY EACH TIME. C.A.B. THINNER IS GOOD FOR REMOVING DRY NITRATE DOPE FROM BRISTLES. NOTE: COLORED DOPES HAVE PIGMENTS ADDED TO BASIC INGREDIENTS SHOWN.

CASTOR (UGH) OIL (NO MORE THAN 10 DROPS TO 4 OZ. BOTTLE) APPROX. PROPORTIONS FOR BRUSH APPLICATION OF CLEAR DOPE. VARY AS REQUIRED.

FOR COLORED DOPES THE PROPORTIONS SHOULD BE CLOSE TO 50-50 FOR BEST RESULTS.

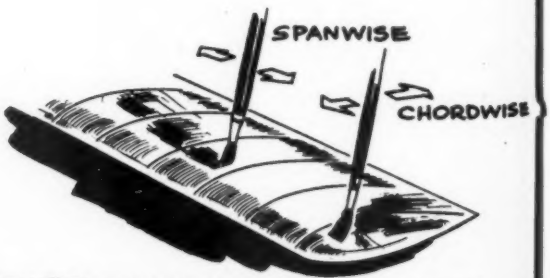
NOTE: PLASTICIZER IS ONE OF THE INGREDIENTS OF ALL COMMERCIAL DOPES. HOWEVER THE QUANTITY MAY BE INSUFFICIENT HENCE THE ADDITION OF CASTOR OIL. CARE MUST BE TAKEN NOT TO ADD TOO MUCH OR DOPE WILL DRY SLOWLY OR NOT AT ALL!

NEVER ATTEMPT TO DOPE WHEN TEMPERATURE EXCEEDS 85° & RELATIVE HUMIDITY IS BETTER THAN 70% OR WHEN ROOM TEMP. IS BELOW 55°

"BLUSHING" IS COMMON IN HOT HUMID WEATHER. ADDITION OF ANTI-BLUSH SOLUTION WILL OFFSET THIS UP TO CERTAIN LIMITS AS SHOWN. ANTI-BLUSH RETARDER NOT TO EXCEED 25% BY VOLUME.

4 OZ. INSTANT COFFEE JARS.

KEEP A READY MIXED SUPPLY OF CLEAR DOPE IN SEPARATE JARS OF DIFFERENT SOLUTIONS AS SHOWN. CLEAR DOPE MAY BE USED AS A SANDING SEALER BY ADDING PURE TALCUM AVAILABLE AT ALL DRUG STORES.



WHEN BRUSHING DOPE ON WINGS & TAILS BEST COVERAGE & SMOOTHEST FINISH WILL RESULT WHEN DIRECTION OF APPLICATION IS ALTERNATED. FIRST COAT SPANWISE SECOND COAT CHORDWISE ETC. THERE IS INDICATION THAT THIS METHOD WILL MINIMIZE WARPAGE. WHEN DOPING NYLON OR SILK, APPLY FIRST COATS SPARINGLY OR EXCESS WILL RUN THRU AND FORM DROPLETS INSIDE.

1 PT. OF CLEAR DOPE WILL COVER APPROX. 12 SQ FT.

PIGMENTED (COLORED) DOPE WILL COVER APPROX. TWICE THE AREA OF CLEAR DOPE

COLORED (PIGMENTED) DOPES VARY DEPENDENT UPON THE COLOR BUT THEY AVERAGE 3 GRAMS PER SQ. FT. PER COAT WHEN DRY

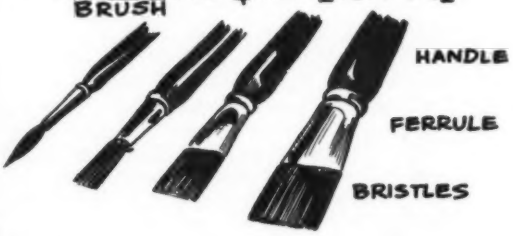
NOTE: THERE ARE 28.3 GRAMS PER OZ.

A CLEAR DOPE FILM WEIGHS APPROX. 2 GRAMS PER SQ. FT. PER COAT WHEN DRY.

OPEN WINDOW

EXTENSIVE DOPING SHOULD BE DONE IN A VENTILATED ROOM. AN ELECTRIC FAN MAY BE USED TO EXHAUST THROUGH A WINDOW

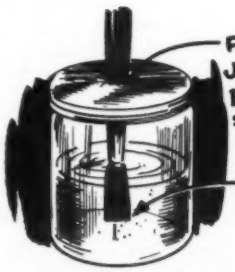
#1 OR #2 STRIPING BRUSH ¼" FLAT ½" FLAT 1-1½"



THE MOST NECESSARY BRUSHES ARE SHOWN ABOVE. BUY THE BEST QUALITY YOU CAN AFFORD.

SOME POOR QUALITY BRUSHES DELIGHT IN "SHEDDING" THEIR BRISTLES. THIS MAY OFTEN BE REMEDIED BY CRIMPING THE FERRULE TIGHTLY WITH PLIERS...

IN EXTREME CASES – TRY FILLING THE BRISTLES WITH HEAVY DOPE BEFOR CRIMPING. WASH OUT EXCESS DOPE.

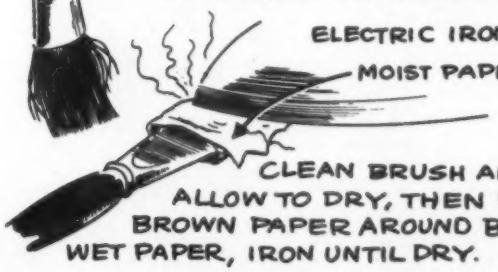


PUNCH HOLE IN JAR LID TO FIT BRUSH HANDLE SNUGLY

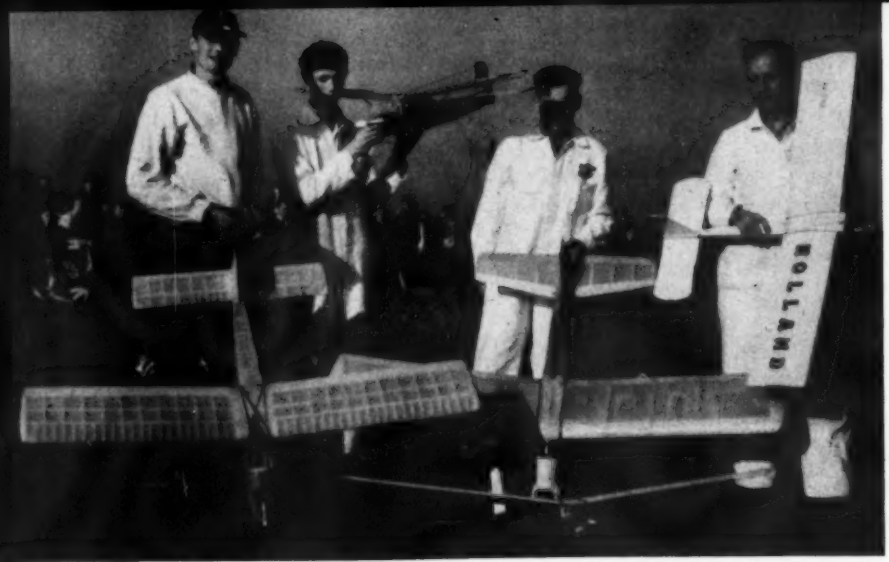
BRISTLES DON'T TOUCH BOTTOM

BRUSHES MAY BE KEPT CLEAN & SOFT BY SUSPENDING THEM IN A JAR OF THINNER FOR A SHORT TIME. WHEN BRUSHES ARE TO BE STORED, CLEAN AND DRY THEM FIRST.

WHEN BRISTLES BECOME BENT & TWISTED FROM STANDING IN THINNER OR DOPE, THE BRUSH IS USELESS. THEY MAY OFTEN BE RECLAIMED IN THIS MANNER.



CLEAN BRUSH AND ALLOW TO DRY, THEN WRAP BROWN PAPER AROUND BRISTLES, WET PAPER, IRON UNTIL DRY.



Picture of Dutch modelers was taken three years ago, suggesting that Holland has made rapid progress in RC-model design. This photograph, and ED engine below, from E. Kreulen, in Rotterdam.

Radio Control News

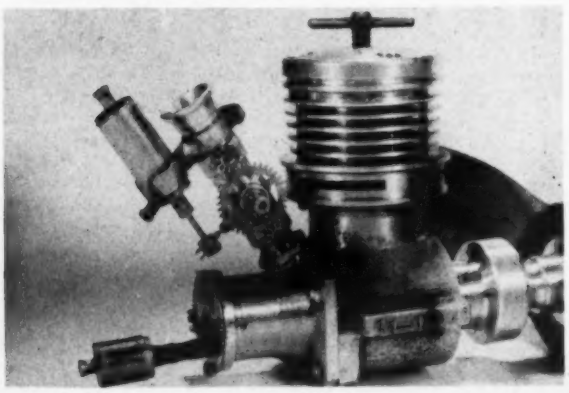
By E. J. LORENZ

Progress in radio control planes reaches a fantastic rate. This round-up of drawings, news, items, ideas from all over the world.

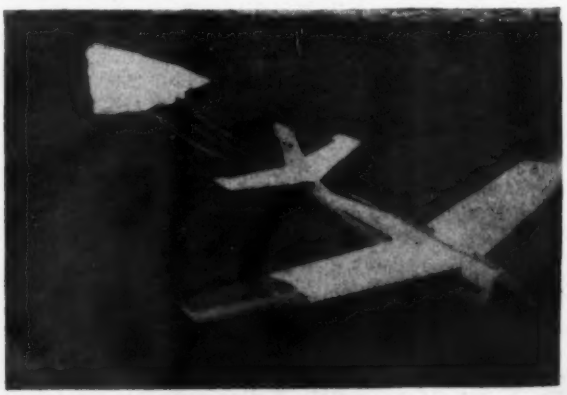
► W. R. Maclay of NEWX Products, Union, N. Y., would like to emphasize the use of sockets when working with transistors. This will eliminate applying heat to the leads of the transistors, which could be permanently damaged by too much heat. The regular sub-miniature tube socket (5-pin) is ideal for this work. If it is not practical to use a socket, leave the leads as long as possible and apply a heat shunt to the lead when soldering. This may be in the form of a wad of cotton which has been moistened with water and packed around the base of the transistor, or you may grab the individual lead with a pair of pliers, between the transistor case and the soldered joint. These methods will help dissipate the heat. The same procedures may be used for soldering diodes.

As was predicted in the June issue of MAN, the transistor power converter, marketed by B & S Products Co., Box 135, Mercer Island, Washington, has become quite popular. A few questions have arisen on this unit and here they are. We mentioned using it with the CG transistorized reed receiver. CG calls for 30 volts as the B supply, but we used 22½ volts with excellent results. Since the frequency of operation remains the same, it would make no difference as to the voltage used. Incidentally, if you have need for a transformer wound for 30 volts, B & S should have them out by now. This makes a fine companion piece for the CG reed unit. Regulation of this unit can be improved somewhat by using a better quality diode such as the CK705A or CK707. It may also be improved by running the input voltage at 6 volts instead of the 4½ volts. This, of course, will give a higher output voltage unless a lower set-up transformer is used. The switching resistance of the transistors themselves will also govern the regulation of the unit. Of course, these transistors would run considerably higher in cost and it is not felt that this cost would warrant the additional regulation obtained. For those of you who are curious about obtaining a higher current output, it is suggested that you try paralleling the transistors. It is also pointed out that, at lower power levels, there are no other devices, outside of a battery, which can give you the voltage and current output without going into bulky and heavy equipment. B & S Products also markets the fully as-

Pneumatic vacuum-control system developed on the Continent leads to engine gimmicks, like this air-fuel control and pump on ED .21.



Modified 9-foot Cavalier, Frank Madl, Chicago, Orwick .65. Has a 9-foot nylon drag-chute, for a 10-foot per second sinking speed.



Webra .15-powered Acrobat from MAN plans (May, 1953), is work of Urban Rosenqvist, Rokbro, Sweden. First Swedish contest last May.

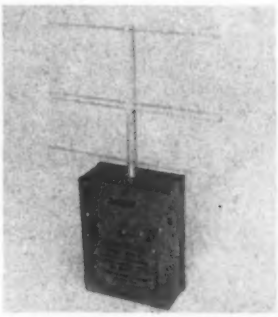
sembled and tested unit, complete with transistors for $12.00.

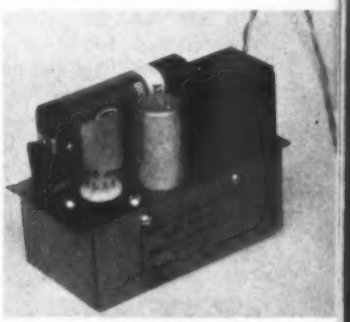
E. Kreulen of Rotterdam, Holland, would like to point out some misleading statements regarding the pneumatic servo system described several months ago. Perhaps this came about by our not deciphering the long hand letters and drawings properly. This system is strictly a VACUUM operated affair. Although it will work on air pressure, there are many disadvantages to this method of operation. To derive pressure from the crankcase of an engine would require an elaborate filter system to remove oil vapors, which in turn would make for sticky valve operation. Secondly, the power required to operate the relay actuated valves is much less with a vacuum than with pressure. Also the connecting hoses will 'stay put' in a vacuum system, whereas a pressure system may develop enough pressure to blow them off unless securely fastened. Third, the energy required to supply a given amount of vacuum to the actuators is much less than would be required for a pressure system. Even though this type of system is not 'sweeping' the USA, there has been enough interest shown to warrant a detailed drawing in a future issue.

How do we eliminate a relay from the receiver circuit, so that an actuator can be used directly, and what kind of a circuit will supply the necessary power? These questions are asked by many experimenters who have an idea that a transistor could be used but they don't know just how. Figure 1 shows the circuit recommended by W. R. Maclay of NEWX Products, Union, New York, for operating the NEWX T700 escapement. The front end, or detector, is fairly conventional and the second transistorized stage could be applied to almost any RK-61 two-tuber front end. This circuit provides positive action, with none of the critical adjustments or marginal operation of circuits using single transistors such as the CK722.

Since radio control equipment has become much more reliable in the past year, it is usually the small details that tend to prove disastrous, especially with home built equipment, or when using new components. We are referring specifically to maloperation due to arcing or sticking relay contacts. With the trend to smaller relays, it becomes more important than ever to protect the small contacts, which often have very little pressure applied to them. Figure 2 shows the situation that prevails when relay contacts open, having (*Continued on page* 24)

Lazy Bones (December, 1954), by Dr. Murray Rich, Covington, Ky., had Babcock single-channel, Adams actuator. Fox .29, 11-5, 7 lbs.

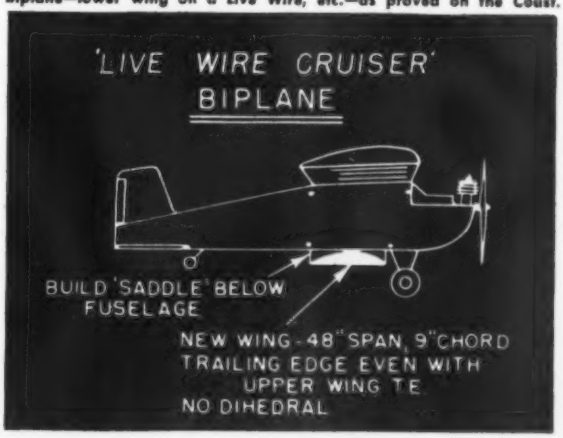


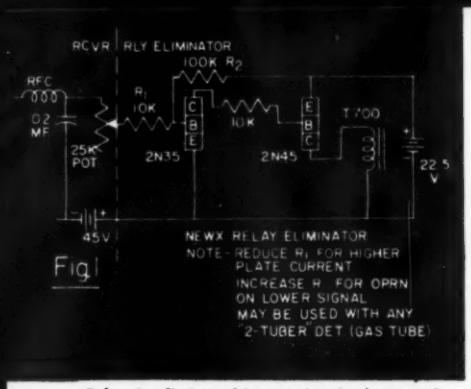


Sensational development is Babcock's tone, transistorized 465. Two-channel, and two different tone single-channel r'cvrs. X'mitter, left.

Graphic presentation of the precision pattern flown in contests appeared in Larks Newsletter, on Coast. Why not fly it regularly?

Answer to wing-loading problem with multi-channel "bombs" is the biplane—lower wing on a Live Wire, etc.—as proved on the Coast.



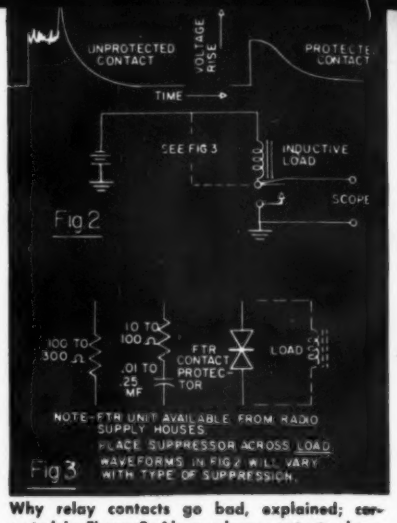


Relay is eliminated in transistorized suggestion, W. R. Maclay, for NEWX T700 escapement.

placed upon the usual inductive load of a coil. This increase in voltage, with the resultant spikes of voltage, can often reach 100 volts or more, depending upon the inductance of the load and the voltage applied. Even a few volts will build up to over 100 volts in this case, especially when a large inductance relay is used as the load across the points. Figure 3 shows three methods of arc suppression which may increase contact life by a factor of 100, minimize RF interference, and reduce circuit failures. The exact type of suppressor for your particular application depends upon the voltage used for the load and the type of load placed across the contacts. The best check is to place a scope across the contacts and observe the waveform. If you do not have a scope, perhaps your local radio or TV service man can be of help.

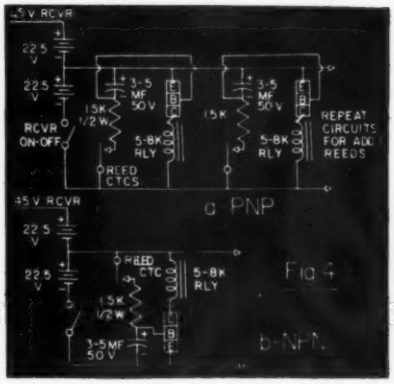
Phil Cutler of New Hamburg, New York, has submitted the circuitry shown in Figure 4. This deals with the use of a transistor to drive the auxiliary relay as used with a reed relay. In order to maintain perfect reliability at the contacts of the reed relay, it is essential that no arcing occurs as the auxiliary relay is energized. This system features increased reed contact life, less critical frequency adjustment and minimizes skipping of the auxiliary relays due to insufficient dwell time of the reed contacts. Outside of the addition of one transistor for each reed contact, no extra components are used in the circuit. Basically, this is how the circuit functions. When the reed contacts close (Fig. 4a), a pulse of current flows into the capacitor, thus charging it. While the contacts are open, the capacitor discharges through the forward biased emitter, base circuit of the transistor, thus increasing the collector current which causes the relay to close. The average base current is sufficient to drive the transistor into saturation. When saturated, the transistor behaves as a near perfect switch, with but about a ½ volt drop between the emitter and collector.

Figure 4a, using PNP transistors, will operate satisfactorily with GE 2N107's or CK-722's. Figure 4b, using NPN transistors, requires that the reed relay frame be insulated from the receiver ground. (*Continued on page* 55)



Why relay contacts go bad, explained; corrected in Figure 3. Always keep contacts clean.

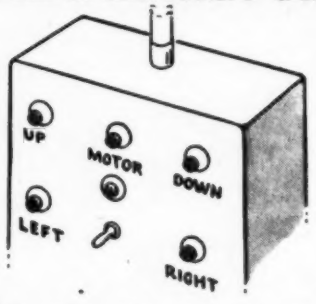
Below—Transistor to drive auxiliary relay as with reed relay: P. Cutler, New Hamburg, N.Y.



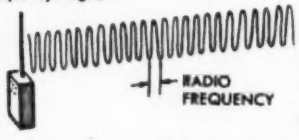
DeBolt servos (DMECO) solve multi-control actuator problems in Ci-Co stunter, by Dean Kenney. Details his plane by Frank Dazey.

5 Channel Control System

AS USED ON DEAN KENNEY'S "CI-CO"

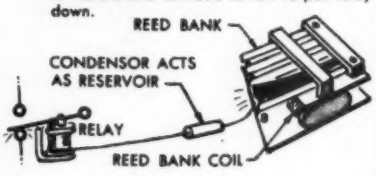


1 Transmitter oscillator sends carrier (radio frequency) signal.

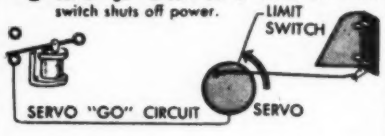


2 Pressing button causes signal to be modulated by one of five audio frequencies.

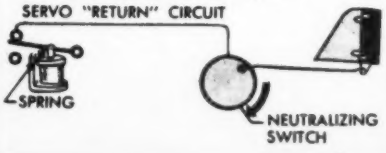
3 Receiver converts this signal to alternating current and sends it to reed bank. The reed which has same frequency as signal begins to vibrate and connects current to pull relay down.



4 When relay is down it connects power to servo "go" circuit. Servo moves until limit switch shuts off power.



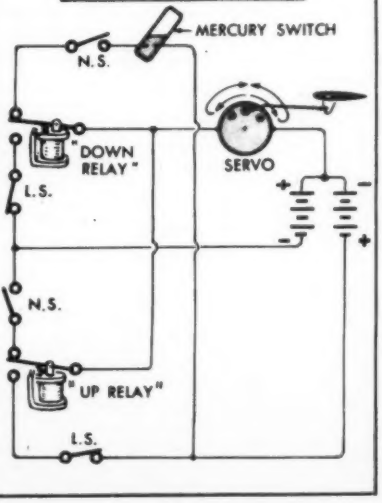
5 When button is released relay connects power to servo "return" circuit. Servo moves until neutralizing switch shuts off power.



NOTE: Complete system has 4 servo "go" and 4 servo "return" circuits. A 5th relay triggers an escapement to change engine speed.

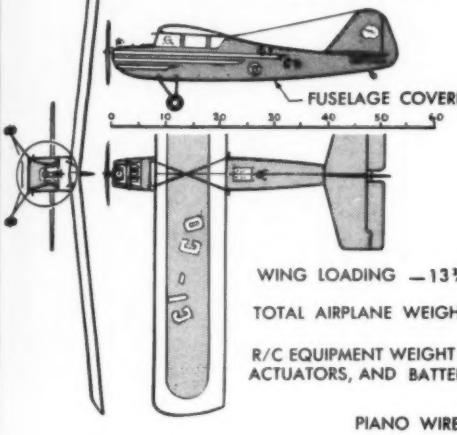
To provide trimmable elevator for inverted flying a mercury switch breaks the down elevator servo "return" circuit when the model is inverted.

COMPLETE ELEVATOR CIRCUIT



"CI-CO" 5 Channel R/C Model

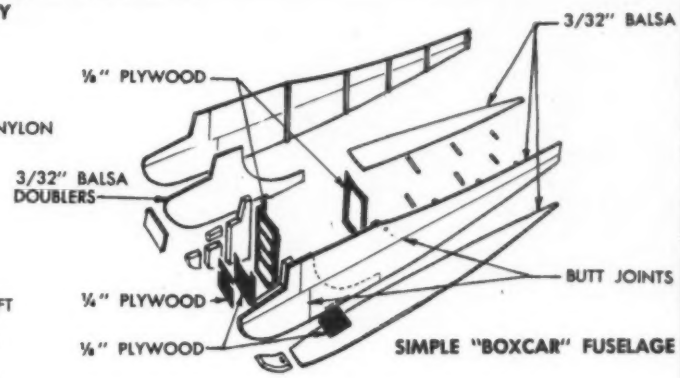
DESIGNED AND BUILT BY DEAN KENNEY



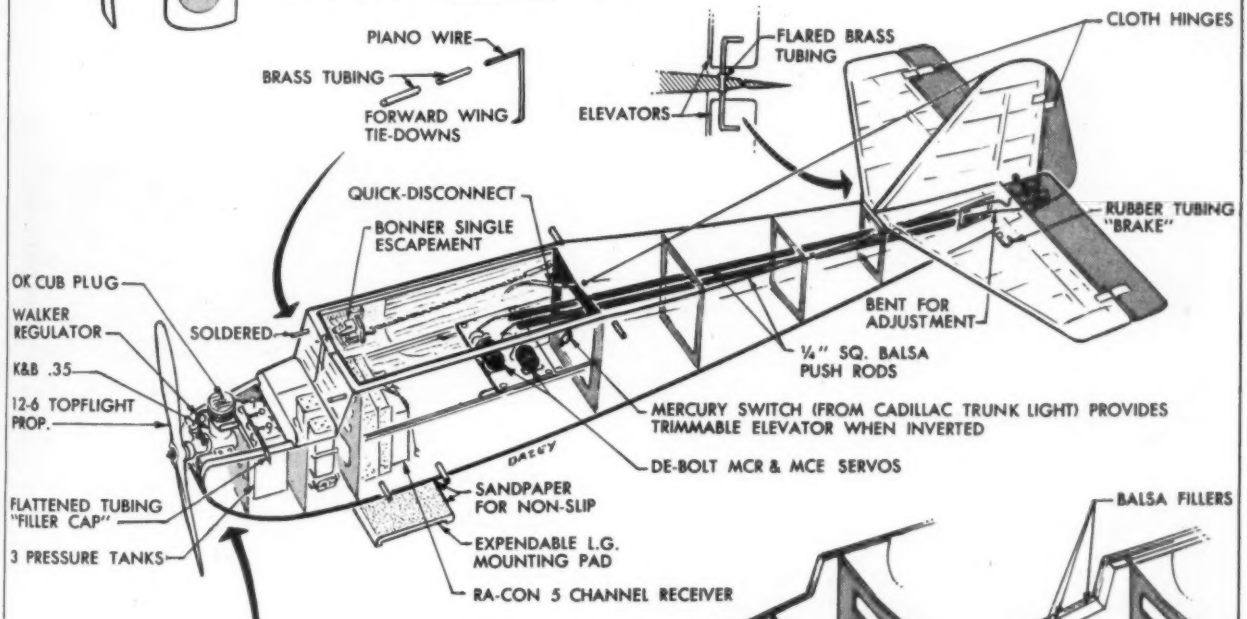
WING LOADING — 13¾ OZ/SQ FT

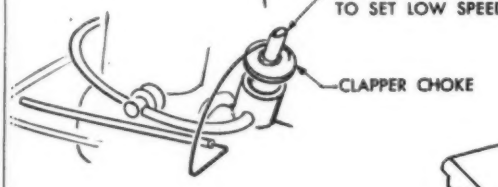
TOTAL AIRPLANE WEIGHT — 7 LBS

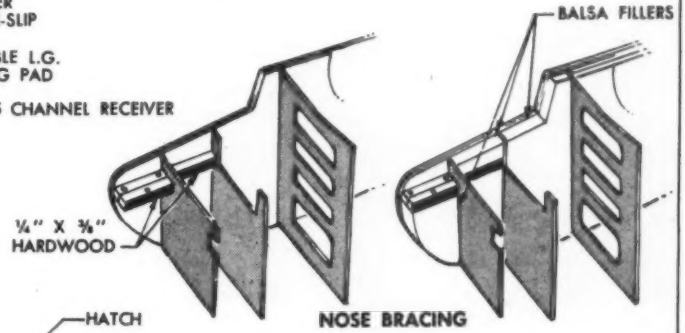
R/C EQUIPMENT WEIGHT (RECEIVER, ACTUATORS, AND BATTERIES USED) — 25 OZ



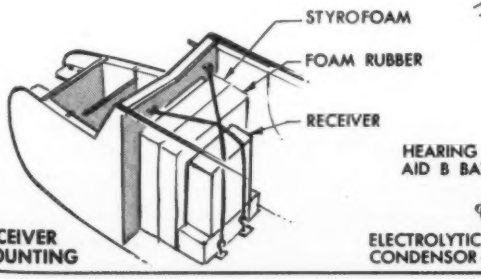
SIMPLE "BOXCAR" FUSELAGE



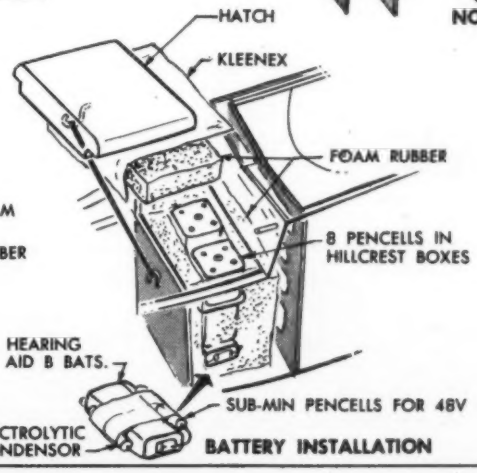




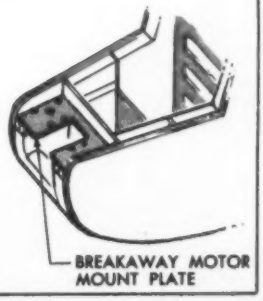
NOSE BRACING



RECEIVER MOUNTING



BATTERY INSTALLATION

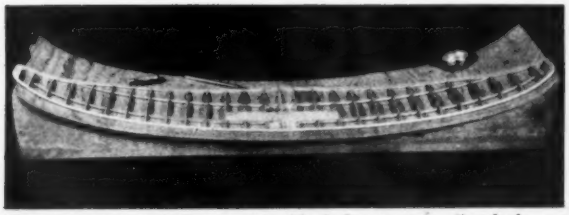


Ascender

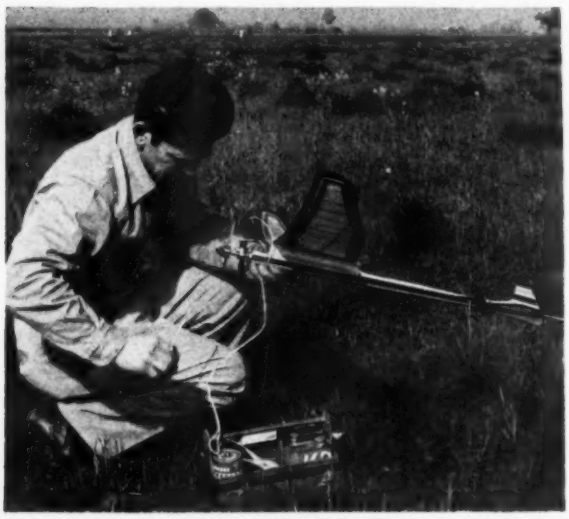
By HAL ROTH & FRED MORTON

Thought provoking articles like this one make valuable reading. Hot free flight uses an .049.

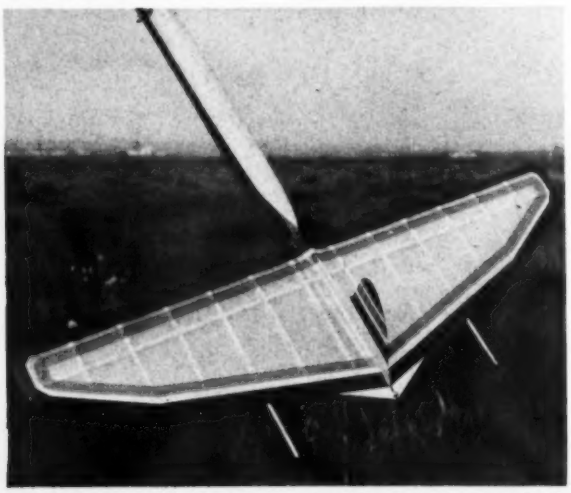
Top view shows off elliptical-dihedral wing. Theory says this kind of dihedral is most efficient. Three wings made to evolve the frame.



One-piece wing is built in a jig; dihedral automatic. Jigs looks as it would be a headache but authors found it saved time in the end.



Fred Morton prepares the model for flight. Ship has round fuselage and smooth wing surfaces. Gear retracts. How skinny can they get?



"Stingers" are used with the gear (at left of fuselage) to hold model for take-offs. Screw stabilizer adjustment is effective, exact.

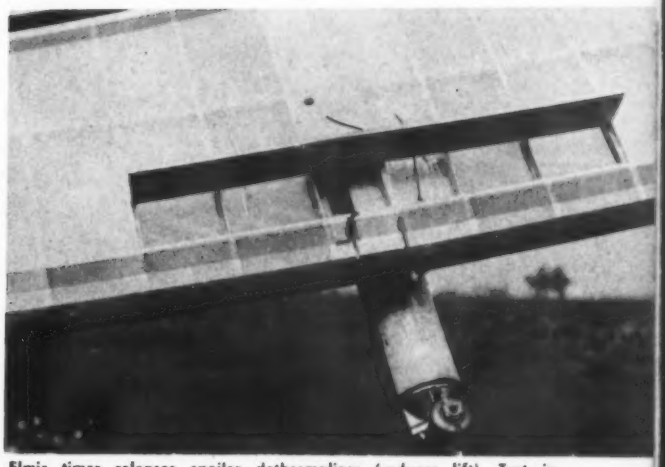
WE wanted a model with six things: 1—a fast high-speed climb at a shallow angle (no hanging on the prop); 2—an elliptical dihedralled wing (more efficient); 3—wing spoiler dethermalizer (no more lost models with popped tails); 4—jack-knife take-off gear (faster starts); 5—permanently mounted tail (no shifting); 6—streamlining and lightness.

To control the climbing angle, we mounted a small movable tab (stabilizer tab) at the back of the stabilizer, controlled by a bolt and two nuts for precise and permanent adjustment. With the tail permanently secured it became possible to fair in the mounting for better streamlining and appearance. This ended all wires, strings, cords, hinges, triggers, and related nuisances running back along the fuselage. No more tail shifting worries.

Past experience with thin wings of generous area has indicated that fast climbs are possible with large areas. Trying to improve, we used a 6% section and eliminated the dihedral joints by using elliptical dihedral. Admittedly, the wing jig is troublesome to construct but, once the jig is made, the wing goes together quickly since it can be laid out completely at one time (no cutting and recementing of dihedral joints). The wing is stronger because it has uniform flexibility, that is, there are no reinforced dihedral joints which strengthen the spars in certain locations but break up the uniform give of the wing. The appearance of the wing is better and, aerodynamically, it is far superior to polyhedral. Once a jig is made, it can be used for all kinds of wings: Wakefield, gliders, etc.

In keeping with the atomic age of models, we used a jacknife take-off gear (why wasn't this thought of years ago? It would have ended all those years of carting ROG boards to contest!-. The jack-knife gear works perfectly and the take-offs are ridiculously simple.

Morton launches the model. Drag tab on wing used for glide circle adjustment. Spoiler dethermalizer allows built-in tail—no gimmick!

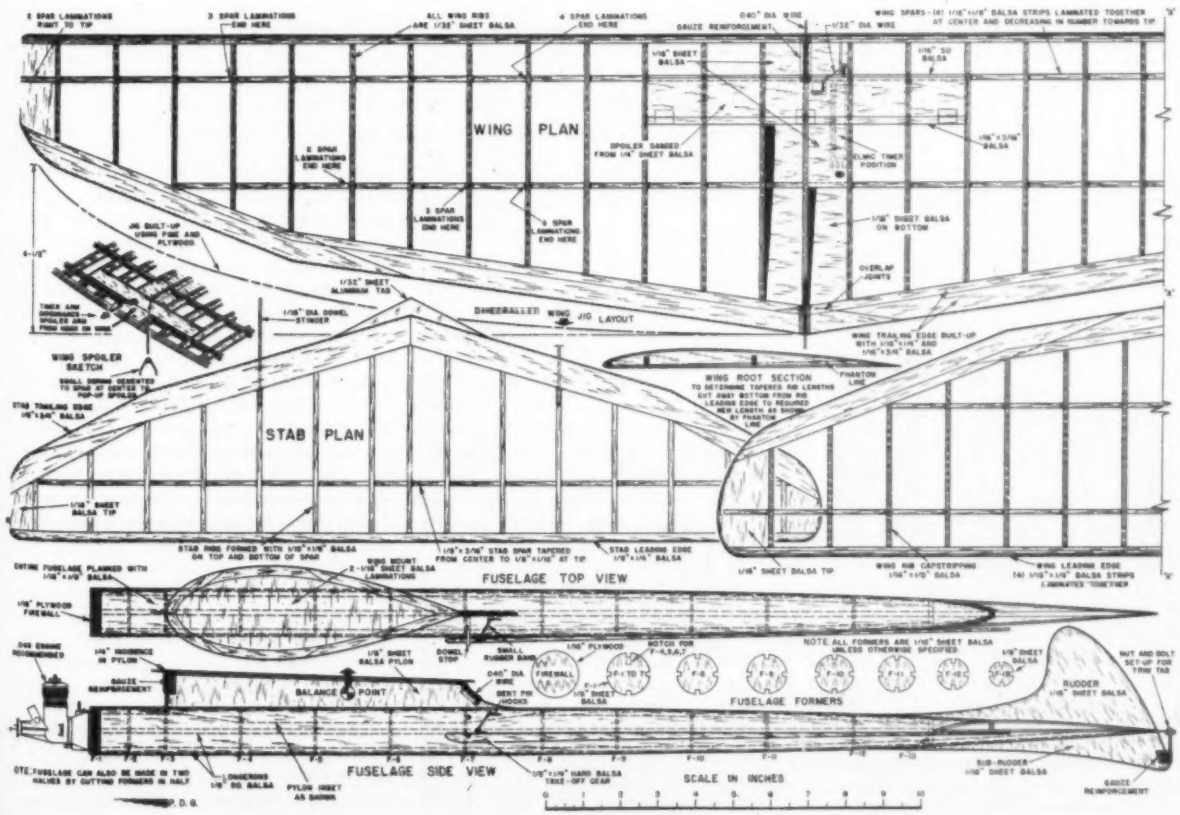


Elmic timer releases spoiler dethermalizer (reduces lift). Test indicated this opening caused vertical dive. Use 1/8-3/16" movement.

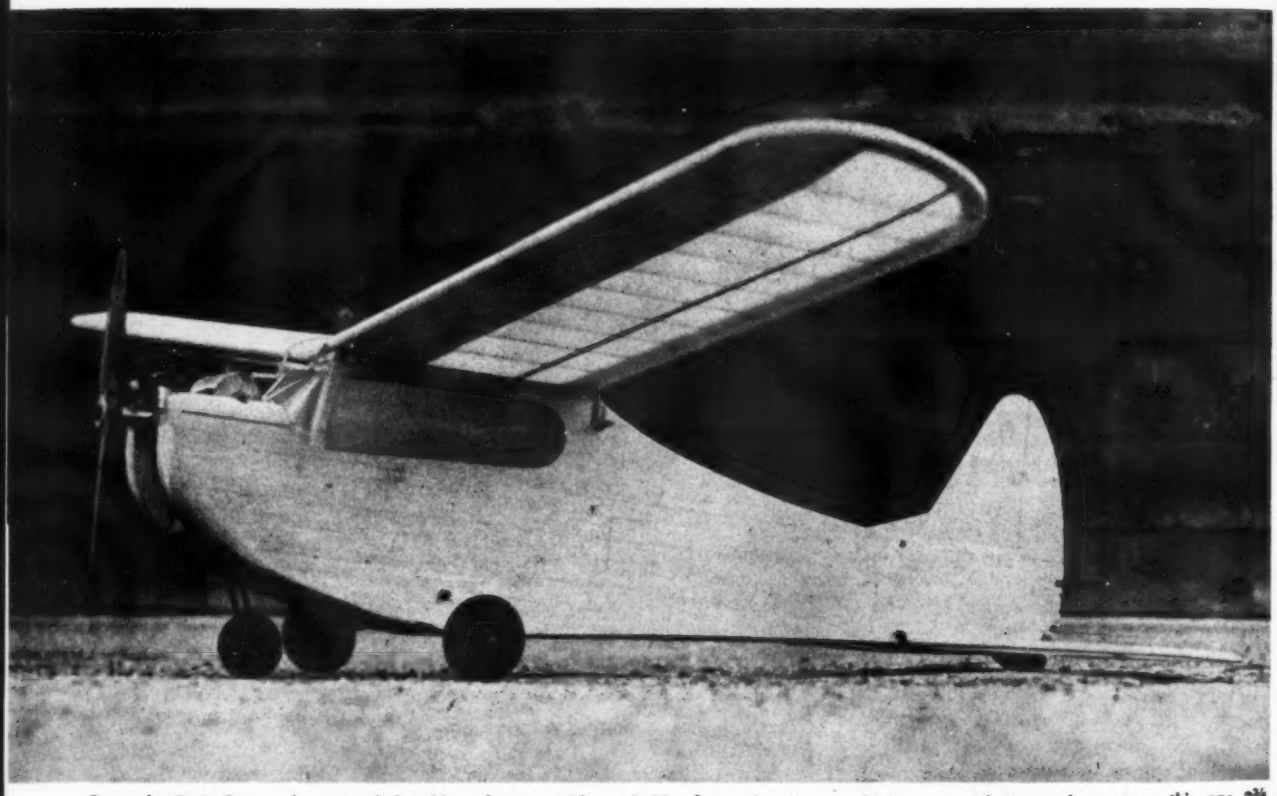
All these ideas worked well except that the wing spoiler was far too effective. To begin with, we had no experience in how big to make the spoiler, where to place it, and what angle to pop it. We decided on one spoiler in the middle of the wing, sized it by guess, and popped it 90°. Then to test, we went out flying one booming day at noon and played around until the model caught a riser and circled at about 500 feet when the DT cut in. Instead of gently descending as we had hoped, the model did half an outside loop and then dove straight in at full speed (from 500 feet). We hunted for the rubble, but except for a broken prop and a dirty engine, the model was OK. On the next flight when we popped the spoiler to 45° the half loop and the dive were repeated. We kept decreasing the spoiler angle until the opening was about ⅛ to 3/16"; the model would then settle like a stabilizer DT, except faster, assuring adequate DT action. The way to adjust a wing spoiler is to start with a 1/16" opening and gradually increase it until the model comes down as fast as you want. Don't start at 90° and work down.

WING: The wing jig is made from a piece of ¼" plywood or thin composition board nailed to a wooden frame. If plywood is used, a number of shallow chordwise cuts will have to be made on the bottom of the piece of plywood so it will bend easily. The frame can be cut from scrap boards. Trace the dihedral pattern from the plans or take several measurements from the plan.

The wing spars and lead- (*Continued on page* 54)



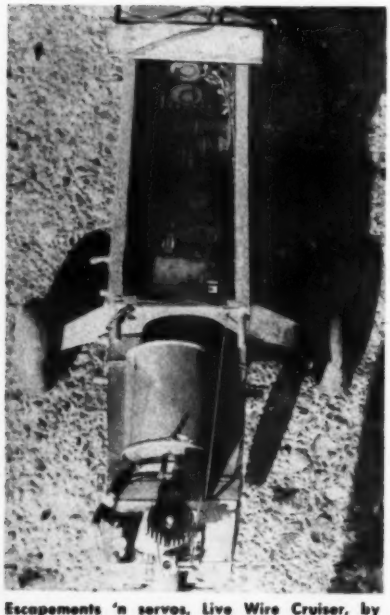
FULL SIZE PLANS AVAILABLE. SEE PAGE 58.



Beam, by R. E. Bowen, has cascaded rudder, elevator, with quick blip for engine. Some multi Beams weigh 5 pounds or more, this one 2¾.

Poor Man's Multi-Control

New, cascade actuator system makes it possible to blip for right, left, down, up or engine—even more—in a small and light-weight airplane.



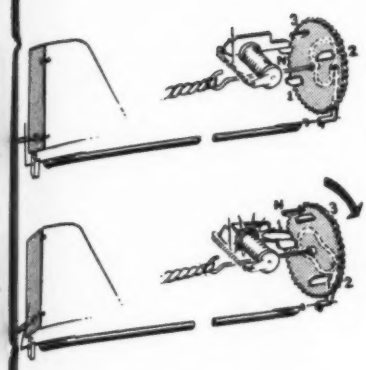
Escapements 'n servos, Live Wire Cruiser, by Chuck Boyer. Babcock single, Bonner, de Bolt.

By FRANK DAZEY

► When it comes to setting up a radio-control system for more than simple rudder-only control, modelers now have three main schools of thought on what system suits them best, namely: a multi-channel reed system, some type of proportional system, or a system using compound and auxiliary escapements with a single-channel radio.

Most modelers have taken to the escapement systems because there the cost is low, the weight is light, and installation and operation are quite simple. It was a great advance when the compound escapement arrived and made it possible to separate rudder from elevator keying, only we still had the old bugaboo of not being able to separate up- and down-elevator (these alternated on elevator signal), and we couldn't separate elevator from engine control. It was possible to hold up- or down-elevator and check your aerodynamic setup with inside and outside loops, but the keying just didn't come natural enough to provide a close feeling of piloting the plane.

Then the home-built cascade setups were developed (one system using microswitches on a compound escapement was described in the April '56 MAN). These really filled the gap in escapement systems by providing separation of all controls. The pilot could at last blip any control, for example, getting a gradual dive by blipping down, or holding down to tuck under as he chose. And better yet, it was found that keying this system becomes second nature and the flier thinks only of what the airplane is doing and where he wants to put it. For the first time a single-channel airplane was able to enter into mock dogfights with multi-channel jobs and put on a good showing. With all this as a background, it came as no surprise to hear that a new escapement for cascade use is now in production, made by Howard Bonner. As can be seen from the sketches it has a completely different layout



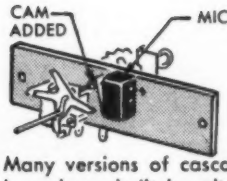
Phantom rear view Vari Comp shows stops on speed-governor wheel, coil-type return spring.

for stops, speed governor, and chassis. The result is a compound escapement which can handle a double row of knots in a loop of ¼" rubber and this larger power is utilized farther by use of the face cam, which is laid out for a more efficient path of travel than is possible with the usual crank and yoke.

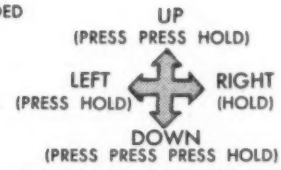
The new unit is named the Vari-Comp to signify that it is a compound escapement which can be used in a variety of systems; without alteration. For example, one VariComp can be used for rudder, and a third position control, and quick blip engine control. When two VariComps are used in a cascade system, quick blip motor control may be added for "full house" (Rudder-Motor-Elevator) and, in addition, another control may be operated by a circuit connected to the third position of the elevator escapement.

All in all, it looks like the average modeler can now look forward to some really exciting multi-control flying without straining his finances, and it will be interesting to see what the long-haired experimenters do with that sixth control action, in the way of wheel brakes, aileron control, or what have you. Then, too, who's going to be the first to cascade five VariComps (would give 15 control actions) in a larger model to work other surpise controls such as smoke screens, glider launching, etc.! The servo switcher should please those who like to build them "huge and heavy" though an 8-pound model could be made to fly inverted without servos. It's difficult to pin down what size model requires servos because this depends on aerodynamics, balance, and other factors. It is expected that cascade systems will help to popularize the smaller R/C models by providing a good multi-system while keeping to a small total R/C equipment weight.

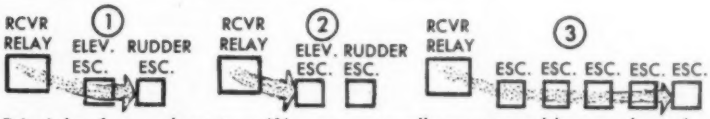
This thing appears to do practically anything. Will it work under water, too? So we tried it! Whereupon, the nearest wash (*Continued on page* 42)



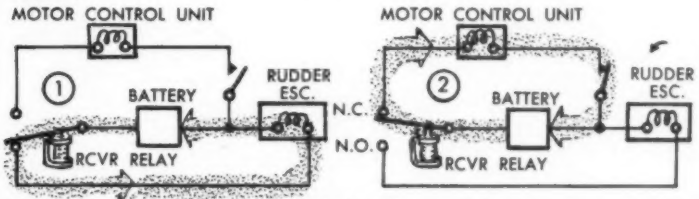
Many versions of cascade system have been built by altering commercial equipment. Method here was detailed in April '56 M.A.N.



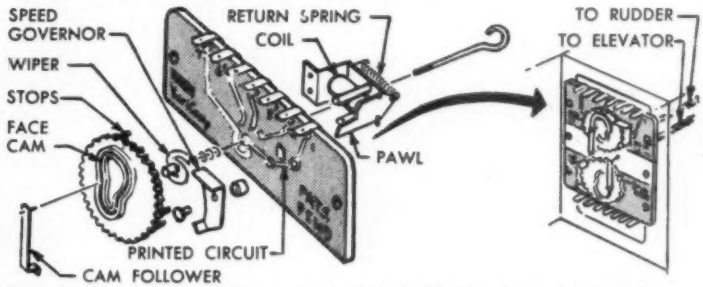
Advantages of cascade system are selective controls and light weight installation.



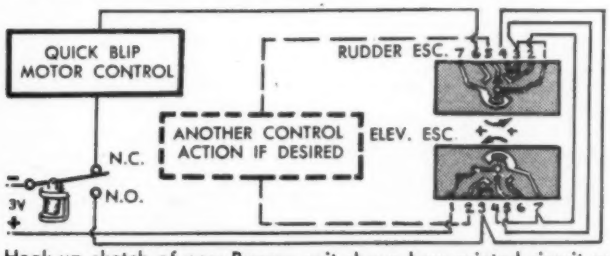
Principle of cascade system: (1) power normally goes to rudder esc. through elevator esc. (2) except that when rudder esc. is placed in its 3rd position, power is connected to elev. esc. coil. When the elev. esc. leaves neutral power to rudder is disconnected. (3) Same principle would apply to any number of esc's. If keying is stopped at any point controls return to neutral.



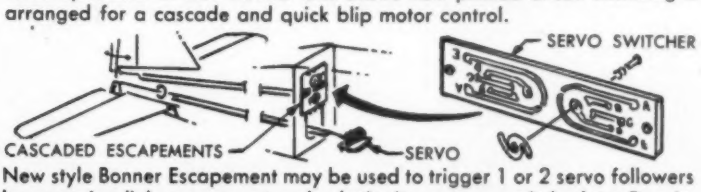
Quick blip motor control fits in nicely with cascade system—works from top of relay. (1) signal (tapping transmitter button) releases rudder esc. from neutral. (2) Just after esc. leaves neutral a switch connects power to motor control unit through N.C. relay contact.



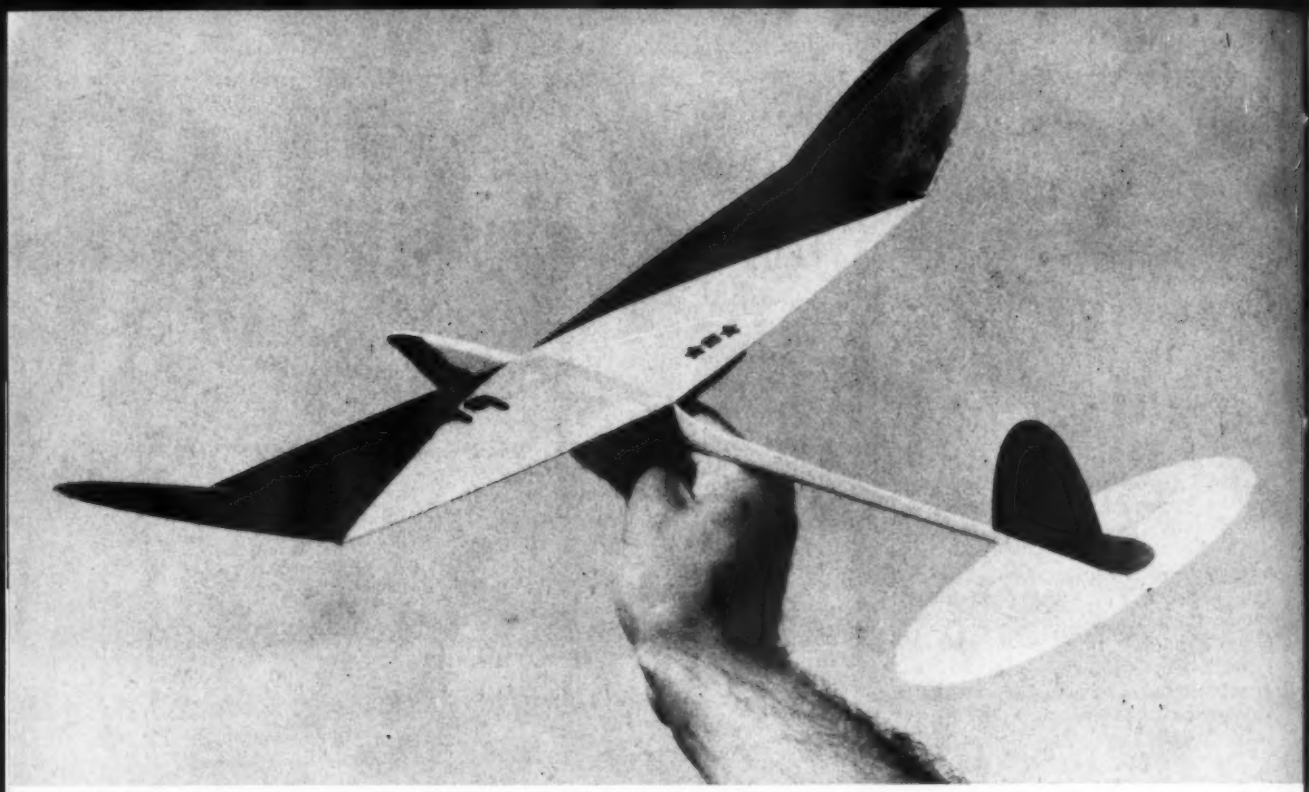
New escapement by Bonner uses printed circuit, wiper, for switching a cascade system. Radical layout. Unit butts against linkage support and everything mounts flush against bulkhead.



Hook-up sketch of new Bonner unit shows how printed circuit switching is arranged for a cascade and quick blip motor control.

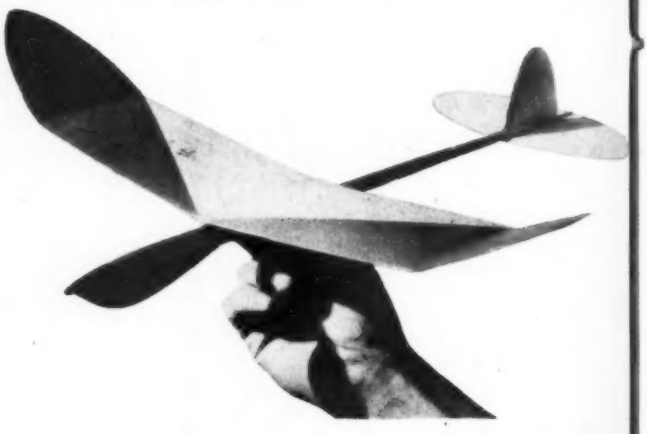


New style Bonner Escapement may be used to trigger 1 or 2 servo followers by removing linkage support and substituting a servo switch plate. Permits quick escapement keying on single channel to be combined with the greater drive power of a servo.



"Guppy" design of nose has important effect on turn characteristics. Modest author doesn't mention, but glider won Nats, scads of other firsts.

the FLANGER



By LAWRENCE H. CONOVER

A good hand-launched glider man has more on the throw than Robin Roberts. This is the way to get both glider and toss.

THE Hand Launched Glider is a very curious bird. Especially the high performance one. It is smooth and clean. Good penetration, and a hawk-like glide. Beauty in simplicity. And the need of a strong right arm.

DESIGN: I have found that the most important requirement for a competition HL Glider is consistency. The ability to pull out gracefully from the poorest launch. To keep the nose UP in the tightest thermal circle. Stability!

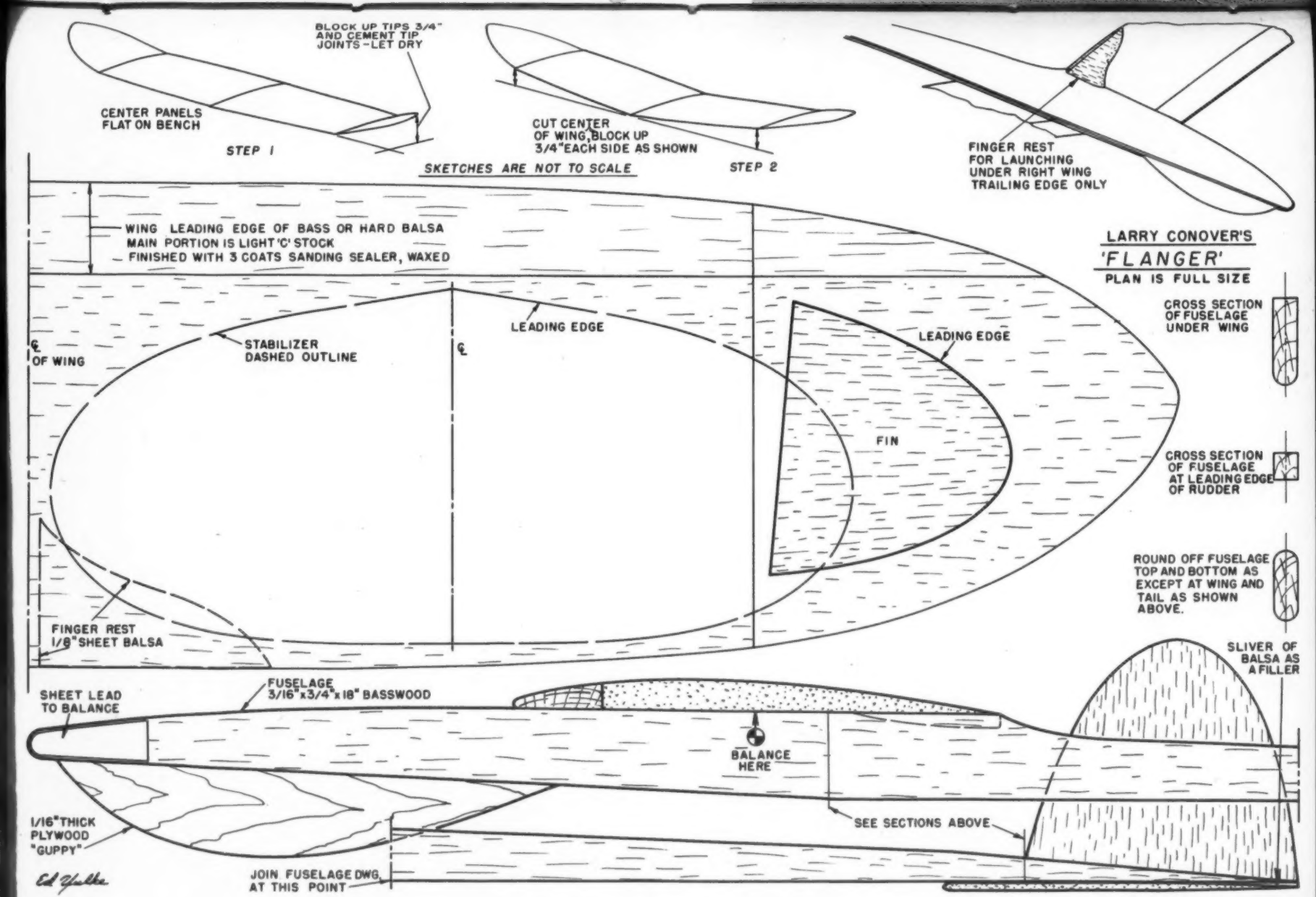
A common maneuver for HL is a stall-out on top of the climb and a corkscrew path down to the ground. To help avoid this the Flanger sports a "Guppy", a 50% of the wing chord center of gravity (C.G.) location, and wash-in (slight warping up of the leading edge) on the left wing. The "Guppy" provides lateral area in front to keep the nose up in tight turns, strengthens the nose, and adds to the profile for better visibility. The 50% C.G. suggests that a straight zero-zero rigging is something to avoid. Wash-in on the inside wing is an old trick for drag-turn and circle-safety. This combination gives good stability.

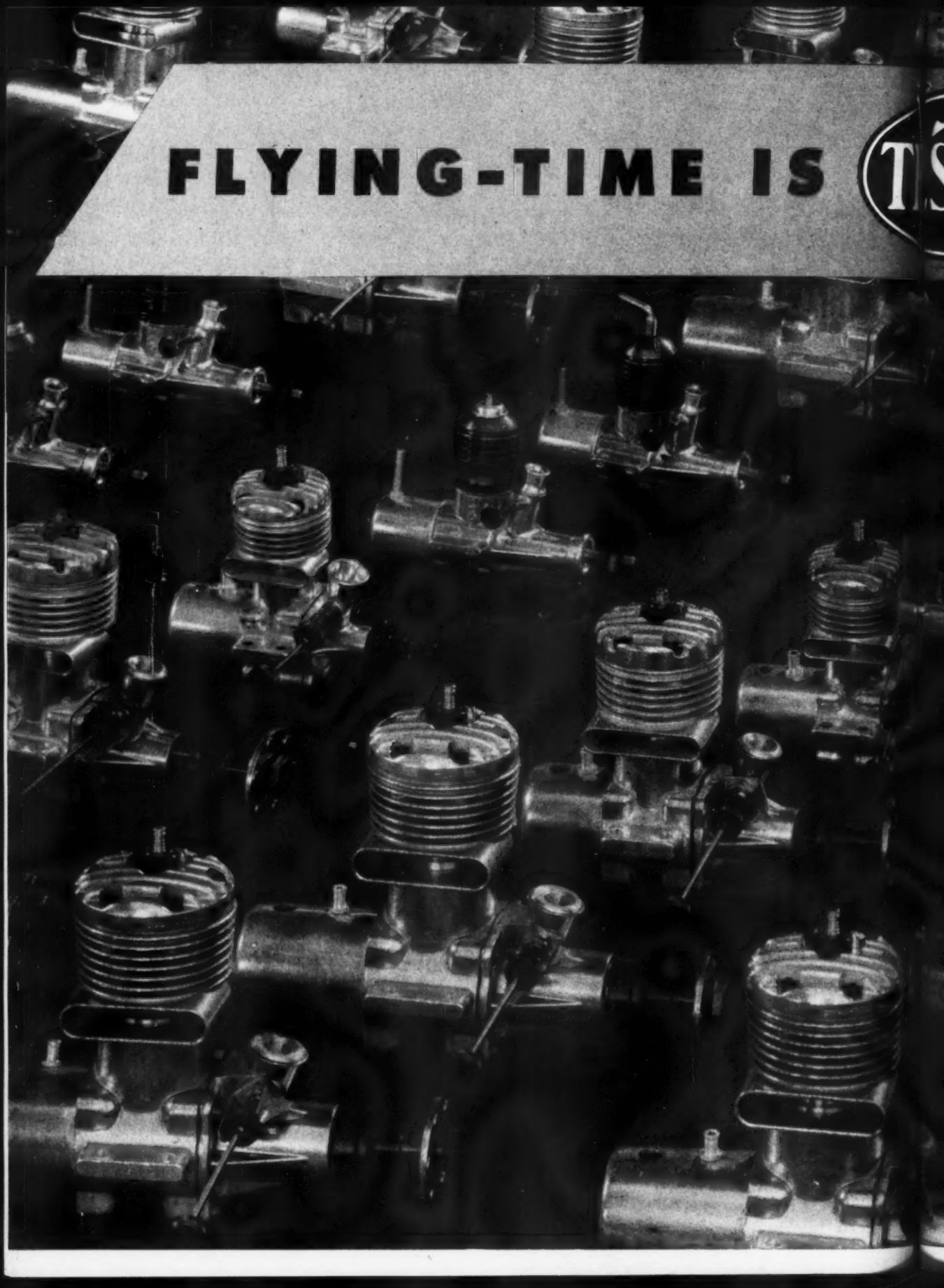
BUILDING MATERIALS: Light clear basswood makes the best fuselages. It is worth a trip to the lumber yard or cabinet maker's shop to find some. For windy weather ships I use basswood leading edges. Use five pound "C" stock for the main part of the wing. This is indoor wood, quite light. (Available from Sig Mfg., Montezuma, Iowa). For the tail group, medium to light 1/16 in. "C" stock.

DECALAGE: The wing and sabilizer are cemented on the bottom of parallel fuselage lines and would seem to have no angular difference. However, a small amount of negative is imparted to the stab, because of its airfoil shape. This will amount to about 3/64 in., which is too much. Reduce this to about 1/64 in. negative with a small wedge between top of stabilizer and fuselage. The wing has a little positive due to wash-in on the left.

FINISH: Use three or four applications of cement at the wing-fuselage juncture. Let dry well between coats. Brush on two thin coats at the dihedral joints after the initial cementing. Brush thin cement along leading edges of wing and tail group, and on the "Guppy" lower edge.

Two light coats of plasti- *(Continued on page 45)*


BLOCK UP TIPS 3/4" AND CEMENT TIP JOINTS - LET DRY
CENTER PANELS FLAT ON BENCH
STEP 1
CUT CENTER OF WING, BLOCK UP 3/4" EACH SIDE AS SHOWN
STEP 2
FINGER REST FOR LAUNCHING UNDER RIGHT WING TRAILING EDGE ONLY
SKETCHES ARE NOT TO SCALE
LARRY CONOVER'S
'FLANGER'
PLAN IS FULL SIZE
WING LEADING EDGE OF BASS OR HARD BALSA
MAIN PORTION IS LIGHT 'C' STOCK
- FINISHED WITH 3 COATS SANDING SEALER, WAXED
℄ OF WING
STABILIZER DASHED OUTLINE
LEADING EDGE
LEADING EDGE
FIN
CROSS SECTION OF FUSELAGE UNDER WING
CROSS SECTION OF FUSELAGE AT LEADING EDGE OF RUDDER
ROUND OFF FUSELAGE TOP AND BOTTOM AS EXCEPT AT WING AND TAIL AS SHOWN ABOVE.
FINGER REST 1/8" SHEET BALSA
SLIVER OF BALSA AS A FILLER
SHEET LEAD TO BALANCE
FUSELAGE 3/16"x3/4"x18" BASSWOOD
BALANCE HERE
SEE SECTIONS ABOVE
1/16" THICK PLYWOOD "GUPPY"
JOIN FUSELAGE DWG. AT THIS POINT
Ed Yulke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TESTORS

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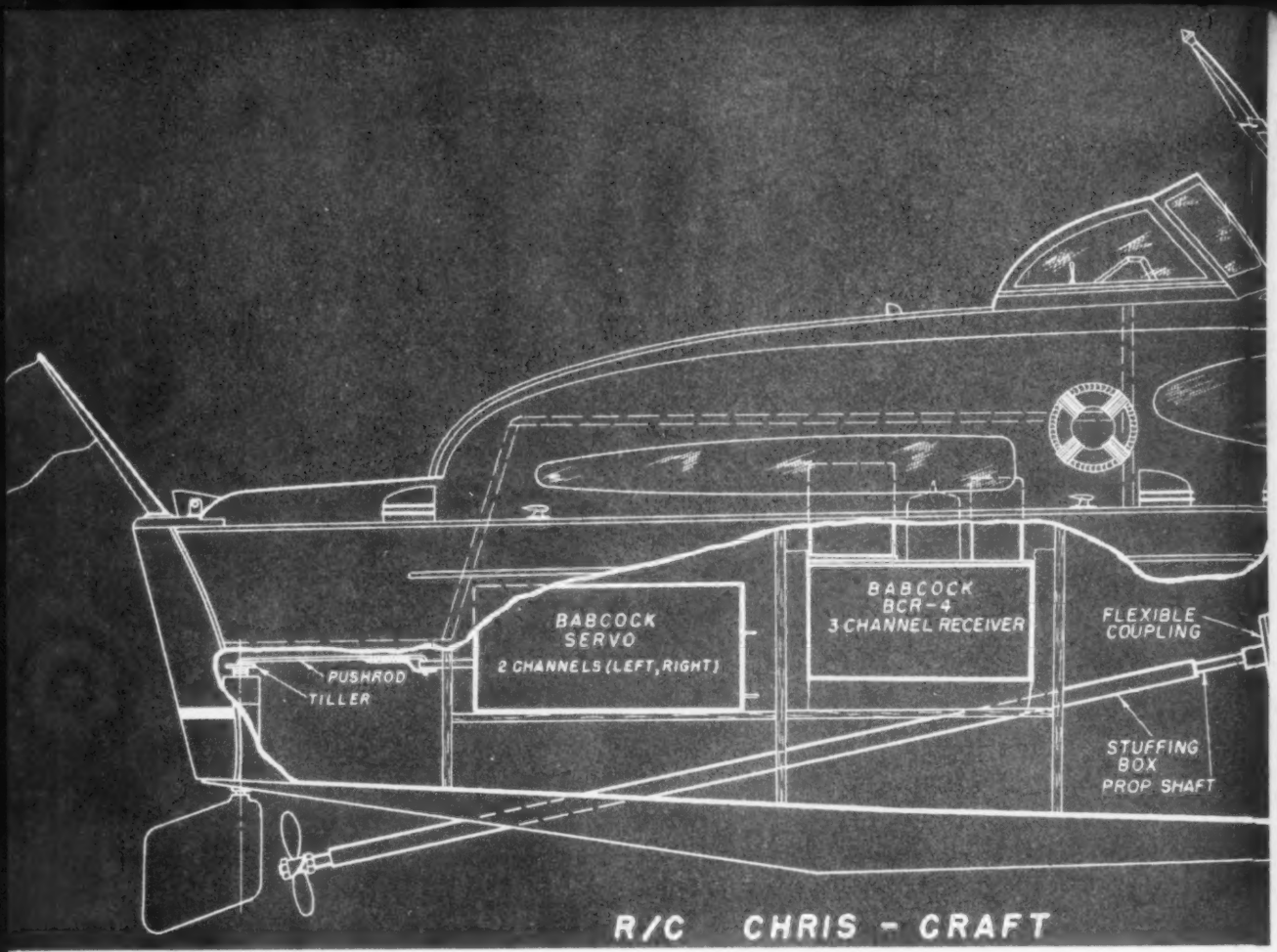
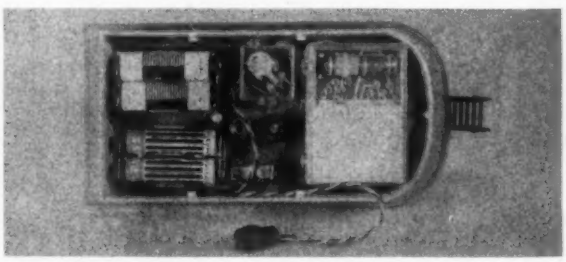
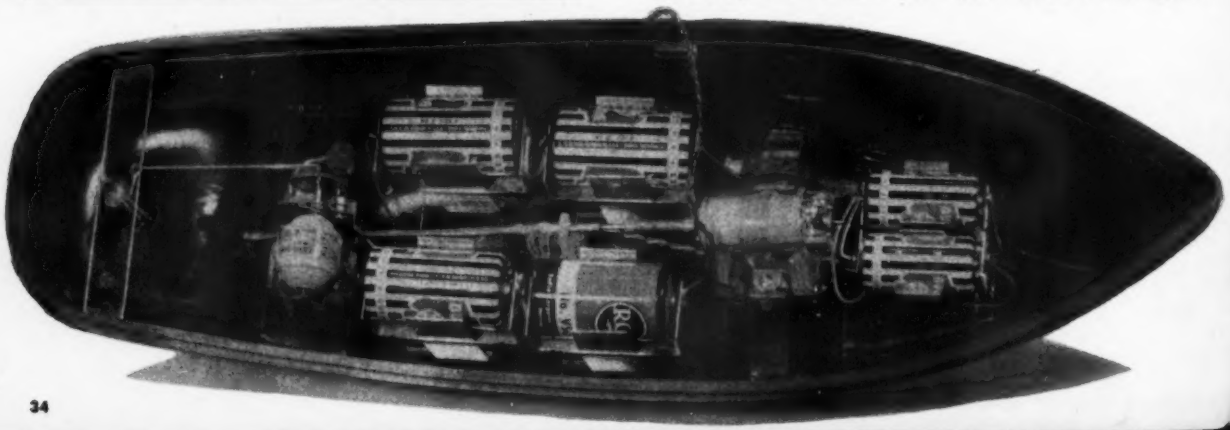
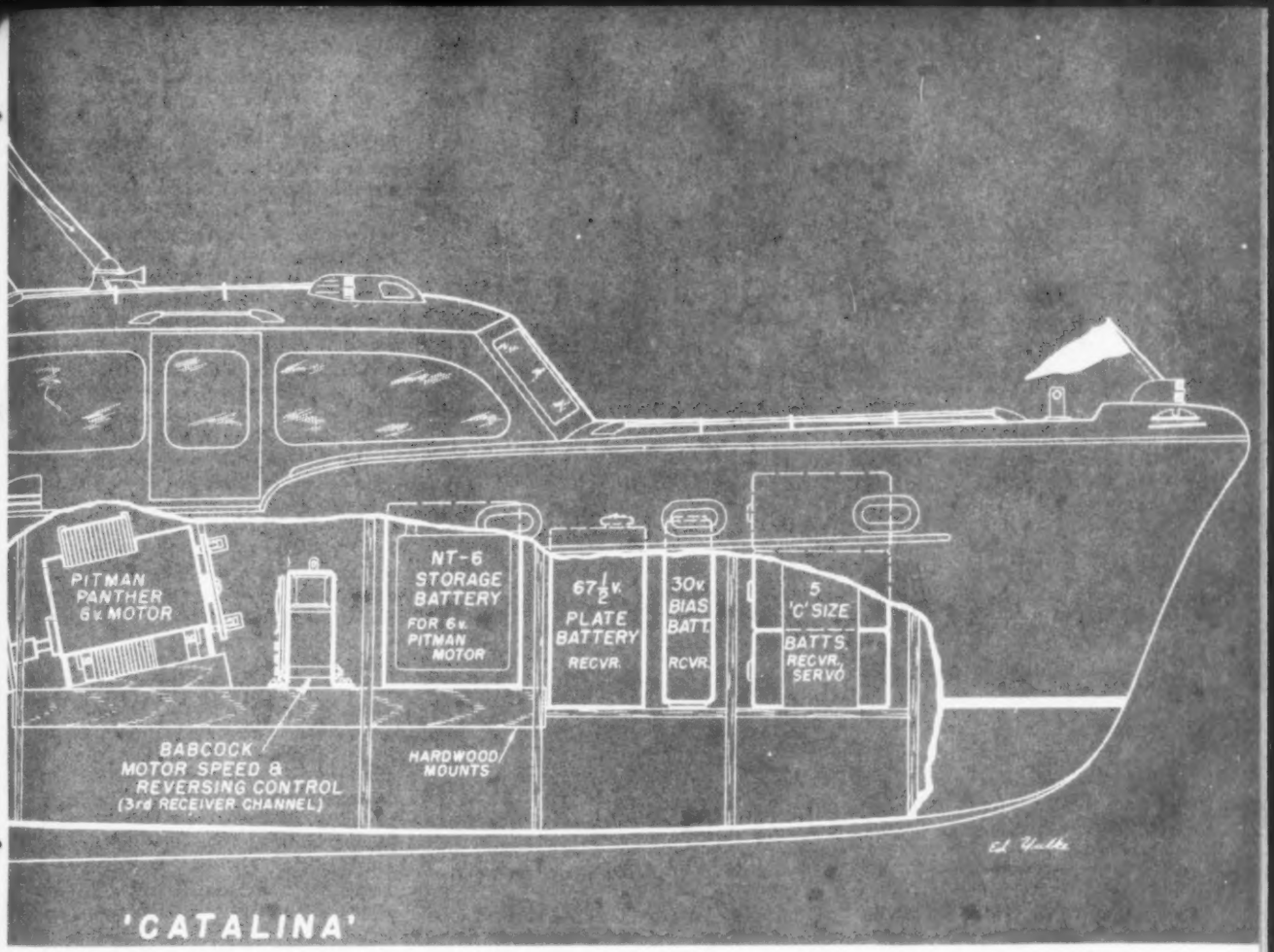


Popular among the more expensive, multi-control installations is the three-channel Babcock, with two-channels operating left and right rudder.



Neat installation Cheryl Ann tug: Aristrol two-tuber (Lorenz) in superstructure, above, with batteries, relay, all wiring. Below—Distler electric motor drive, deBolt 2PN servo for rudder, with their batteries in hull. Put together, left, tug on a scow prowl. One of several tug kits.





The third channel works Babcock sequence switch for operating motor-speed and reversing controls. Dumas, Berkeley, Sterling, etc., cabin cruisers.

About R. C. Boats

By BILL BECHER

Lack of flying sites, lost and crashed airplanes, all have contributed to boat boom. Guys at sea can set course with this info.

► Manufacturers are making it easy to get a quick start in R/C power boat modeling. In your favorite model or hobby shop you will find everything from 3-foot plastic tugs and 4-foot pre-fab cabin cruisers to little 14 and 16-inch craft.

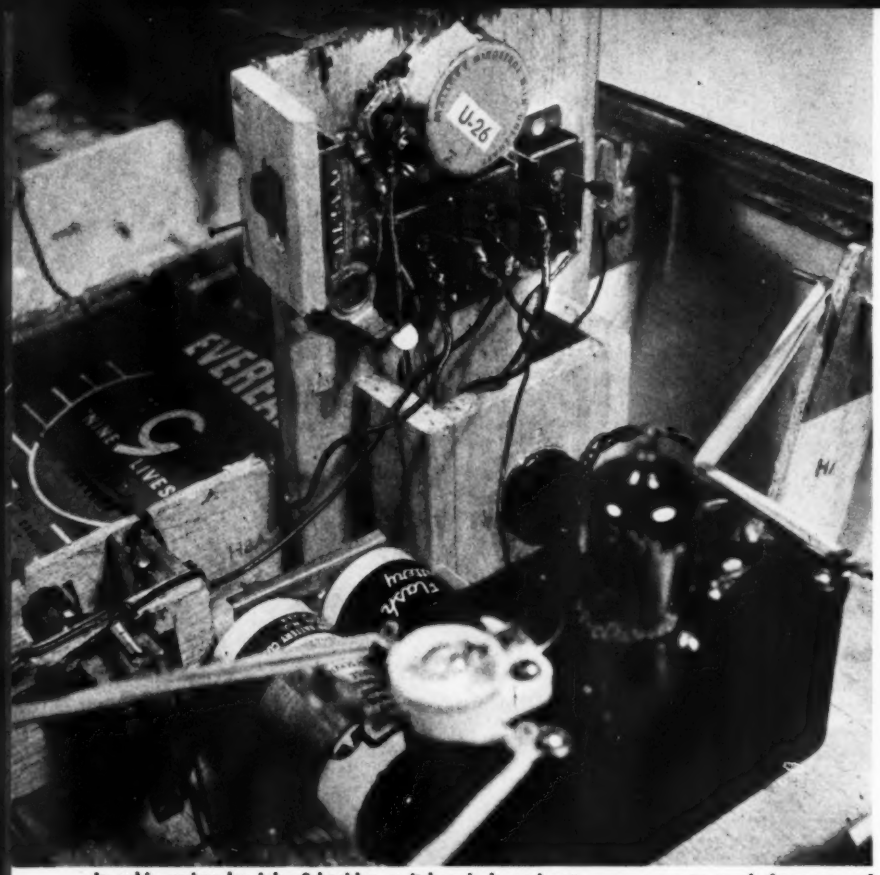
The big jobs will handle the weight of the most complex of electronic gear you can dream up; the small jobs require careful workmanship and patience to control them. They are not for the "first job" but are sure to attract more than their share of attention on any pond. You can make practically full-scale tests with them in the family bath!

At least one Pyro plastic tug has been radio-controlled. Packed into the hull are the following: ECC hard-tube receiver, three 22½ hearing aid batteries, eight pen cell batteries, a Distler motor and a 2-position escapement. The hull is only 13½ inches long and 3½ inches wide. It's really round and firm and fully packed! It may not set any speed records, but, even more important, it steers and goes every time!

Illustrations of the Cheryl Ann show how the pros put in an R/C installation. Polk's has taken this 20" plastic tug and added one of the neatest jobs of R/C installation you're liable to find anywhere. Packed into the cabin which measures a little under 3½" x 7", are a printed circuit two-tuber, Jaico relay, sub-mini "pot," sub-mini metering jack, toggle switch, two 22½ hearing aid batteries in battery boxes and two pen cells in battery boxes.

Most of the smaller components are mounted on a sheet of clear plastic with only the handle of the off and on toggle switch protruding through the roof. Both the receiver and the relay are protected by plastic cases. In the hull, reading from forward aft, are two "C" cells in parallel to supply 1½ volts to the servo, a Distler motor and spring universal. Four "D" cells in series to supply 6 volts to the motor. DeBolt 2PN servo and its rudder linkage. Socket for receiver relay connections. All these components are mounted with strips of clear plastic. Not a single stray wire anywhere.

The logical question at this point is, "What is the best installation to put in *my* boat?" It's not an easy question to answer. In fact, the answer depends to a large extent on what your tastes are, the size boat you want and, most important, the size of your pocketbook. In the R/C library at present there are at least a dozen books on R/C



In cabin cruiser by John Schneider, switches, jack, and pot, prove easy to reach from rear of cabin when superstructure in place. Rubber-mounted receiver necessary because of airplane prop.

and at least a dozen magazines in the English language. Each of these presents hundreds of circuits and installations that may add up to just what you want. To help you get started, here is a round-up of some of those ideas, a few notes cribbed from the manufacturers' instruction sheets and a rare, original idea or two.

Before you start your boat, a good piece of equipment to invest in, is a log book! A fibre-covered note book from the dime store will do. The name of the boat goes on the cover. On the first few pages go all the vital statistics of the boat. Make up your own list of information to include. But here are some suggestions. First, put down the date started and later the date commissioned (finished.) Put down the type of glue or cement used and the type of paint. This can be important. A year or two later you may want to refinish a deck and will want to know whether you used fuel-proof or not. Different finishes sometimes just don't mix.

Next should come the details and circuit diagram of the R/C installation. It should be kept right up to date. Every time you add or change anything, put it down. Sometimes instruction sheets get misplaced. If you have a log book on each boat, you have the information you need right at hand. Finally comes the log part, itself. Each time you run the boat, make a notation of all the pertinent details such as time run, meter readings, distance run, date batteries are installed, etc. These entries will help you keep track of battery life and general efficiency. This list is by no means complete. You will probably be able to think of dozens of more items to include.

Now comes a lesson learned the hard way. After you have the new kit boat at the stage of construction which calls for the side and bottom planking, stop a while. This is the point to start installing the mounts for the radio gear. Make all the platforms and mounts for the various items of equipment from thin plywood and lay them in place. Plywood is a must. The fastenings just pull out of balsa. Spot the mounting holes for the various components and fasten them temporarily in place with "blind nuts" under the plywood platforms. Wood screws do not hold at all well in thin plywood. Platforms can be fastened in place temporarily with small (0 x 3/8") wood screws or small brads and side and bottom planking commenced. When the boat is finished and trim in the water determined, the platforms can be glued in place.

While on the subject of planking, here is a well-tried idea. You can add quite a bit to the strength of the hull by paper covering. (Do not use paper, of course, on natural-finish mahogany hulls.) For medium-sized hulls, use Rayspan or Skysail, etc. For the big ones, use silk or nylon or try some "Miracloth" from your nearest super market. "Miracloth" is about three times as thick as Rayspan and comes in rolls, 14" x 11' and 18" x 50'.

Here is one last point under construction notes. If you intend to use a wet cell (Willard NT6, etc.), be sure to dip the platform or box that will hold it, in hot household paraffin before you fasten it in place. Also be sure to coat the hold-down hooks and anything else that comes in contact with the battery case with wax on wood —or vaseline on metal. If you neglect this, corrosion can eat right through the hold-down hooks.

A quick survey of some of the largest hobby shops here in the New York and Westchester area turned up the fact that about a half dozen or so kits for R/C boats were the best sellers. These were Ideal Models' 23" Richardson Sedan Cruiser at $8.95; Sterling's 31¼" Catalina at $11.95; Berkeley's 31½" Cobra at $9.95; Veco's 35" plastic tug at $24.95 and Dumas' 33" Commander and 33½" Challenger at $9.95 and $10.95. These have been the most popular sellers over the last year or so in this area. Others may be popular in other areas. Any one of these boats would make a good starting point in R/C.

Another basic consideration in your choice is the answer to these two questions. First, how is the propeller to be turned? And, second, how is the rudder to be turned? These questions come up whether you are building a plastic "quickie" or a boat built like the real ones with every last bulkhead and fitting. For the beginner, the answer to question one should always be, "with an electric motor." Just as in control line or in R/C planes, you don't learn to fly with a "smoking bomb." Rather, you learn with a slow steady flier. The same rule applies to boats.

With a 23" to 28" hull, one of the medium-size Pittman motors and a six-volt wet cell, you can move along at a pretty fair clip. The same size hull with an .09 or an .19 will really step out and demand a really rapid finger on the control button to miss assorted banks, rocks, boats, swimmers and other hazards. Consider further that with an electric motor, you can stop, reverse and go ahead again at will. Even slow astern and slow ahead. Try that on your diesel or glo engine!

After a few lengthy sessions with "Old Reliable," you are ready to start work on that super-duper racer with everything aboard but the galley sink. Or you can convert "Old Reliable" to glo or diesel.

When you build the basic hull, try this. Space the engine mounts ¼" lower than the plans call for and wide

enough apart to mount an electric motor on ¼" spacers. Put in a shaft and shaft tube heavy enough to work with the gas engine of your choice. When you're ready to convert to gas, make up a mounting plate of ¼" ply with a cut out for the crankcase and fly-wheel and mount it, using the same holes in the mounts that the electric uses. (Blind nuts please!) With no tears, you have a double duty boat, electric to learn the "how-to's" and for small ponds and crowded waters, and gas for large lakes and lots of smoke. With the latter system, a fuel-proof finish is a must of course.

Here's another tip on the subject of modifications to kits. The addition of just two simple parts and a little rewiring will make the installations shown on both the Sterling and Ideal plans into a self-neutralizing rudder system. Fig. 1 shows the parts. The contact plate can be made from copper laminated printed circuit material or from ⅛ plywood with the contact segments made from shim brass and stuck on with Pliobond.

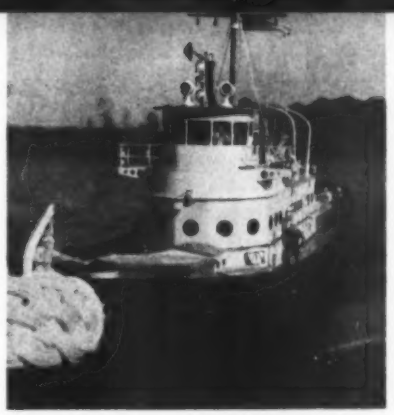
The contact plate is bolted face out to the frame of the Wilson gear train. Next the contact, which should be a snug fit on the shaft, is adjusted to bear on the contact plate and soldered in place. Last comes the crank and pin. Wire up according to Fig. 1; adjust the position of the crank on the shaft from the gear train so the rudder moves to neutral when you release the transmitter button. That's all there is to it.

Another advantage in using electric power is that a husky escapement can be used to turn the rudder. The answer here is twin rudders, out of the prop wash. The same escapement, or a compound, can later be used as shown in Fig. 2 to act as a switch to control a rudder servo for gas power. Fig. 3 shows a really de-luxe installation, using the triple escapement detailed in the June '56 issue of M.A.N., a Babcock motor speed control and sequence-reversing relay and a stepper, Lionel "E" unit, or what have you.

With no complications at the transmitter and a small amount of memory, you can get an awful lot of controls for your money. The beauty of this system is that the main function, steering, is simple. Press once and hold, right rudder. Press twice and hold, left rudder. Press three times and hold, speed and direction control. One quick blip gives you one or more of the extras you've dreamed up for yourself. For instance, one of Berkeley's 324-1 gear ratio "Wonder" motors raising and lowering a flag, with direction of rotation controlled by a modified Lionel "E" unit.

The same system will operate a gas-powered boat by changing the wiring slightly and using the "extra" contact to control a standard motor control escapement. The "third position" then becomes the control for the "extras." It is possible, using a dropping resistor, to "steal" the current for all this gear from the Willard NT.6. The battery leads should be in parallel with the motor leads with the dropping resistor (approximately 4 ohms at 10 watts) in series with one of the leads. This method is a good one for any installation. The drain is momentary and in even the most complicated hook-ups, won't seriously shorten the life of the charge of the battery. It also saves finding space for, and buying, one or more sets of auxiliary batteries.

Perhaps escapements, and the attendant rubber strands, don't appeal to you. That's where the clockwork escapement comes in. Its fully wound spring has a lot of "muscle" and will handle up to 50 rudder movements on the 4-arm wheel. By using it as a 4-arm escapement, (it's supplied with both 2 and 4-arm wheels, readily interchangeable), and mounting a contact at one of the neutrals you can get a third control. The contact should close a time-delay relay (the cheap, surplus "blanket" relays are fine) which in turn operates a sequence relay or servo. The same deal will work very well on the 4-arm, rubber-driven Cameron boat escapement.



Fifteen men, yo-ho, and stuff. Will you look at the crew on this scale craft! Repeat, a model.

Servos are the newest thing in the control line. DMECO makes seven different types. For rudder only, in any size boat, the 2PN is just what the doctor ordered. It has two positions and an automatic neutral. In the picture of the hull of the Cheryl Ann, one can be seen nestled snugly in the stern. The 3PN has two positions with an automatic neutral for the rudder plus a second actuator circuit which can control a 3P servo which, in turn, will handle gas-engine speed control. The 5PN special boat servo has wrapped up into one neat package all the controls you need for rudder and stop-start reverse control of an electric-powered boat. If extreme simplicty and a minimum of work is your aim, the DMECO 5 PN was designed just for you.

This by no means exhausts the list of control systems using only a simple push button at the transmitter. There are literally hundreds more in books on the market, on R/C and "home-brewed."

If the (*Continued on page 42*)

A couple of nifty tricks used by the author, based upon existing equipment. Figure 1—Self-neutralizing feature for Sterling, Ideal plans. Figure 2—Bonner idea for switch on escapement to control servo rudder. Figure 3—Triple escapement, June MAN, Babcock servo on rudder.

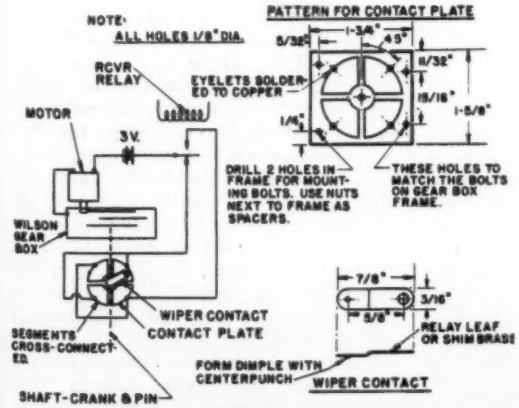


FIG. 1

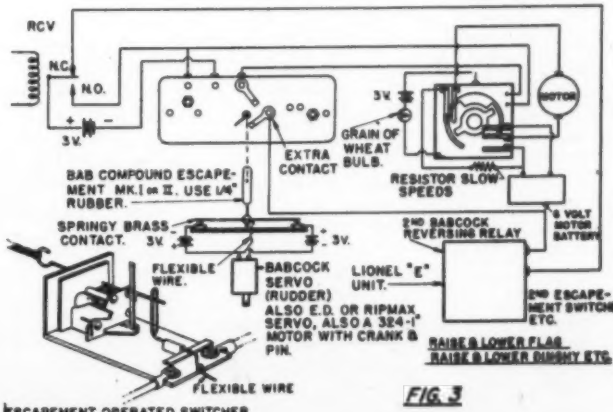


FIG. 2

FIG. 3

FOREIGN NOTES

A monthly world-wide round-up of technical developments, designs, significant industrial products.

P. G. F. CHINN

Australia

Recent rule changes in Australia are interesting inasmuch as the new free-flight rules drawn up are diametrically opposite to the lately revised FAI formula. The existing Australian power-loading of 8 oz. per c.c. (131 oz./cu.in.) has, in fact, been abolished and power-weight ratio is thereby now virtually unrestricted. This applies to three National classes: Class I for engines up to 2.5 c.c. (.15 cu.in.); Class II, 2.5-5.0 c.c. (.15-.30) and Class III for 5-10 c.c. (.30-.61) motors. The FAI class is retained as a separate category for International eliminators, etc.

While the FAI's new 231 oz./cu.in. loading rule is, we feel, a bad move, we cannot really enthuse over the Australian move in the other direction. Both are needlessly extreme and while the FAI formula will produce relatively sluggish models which will be all too dependent on thermal assistance, the new Australian rule may well result in the apperance of flimsy, overpowered jobs, grossly sensitive to trim adjustments, with which it will be exceedingly hard for the average modeler to obtain consistent and crackup-free performance.

B-25, powered by two Max .29's, built by Kohei Ueda, Nagoya Model Airplane Club, Japan.

Other rule changes include the recognition of a 3-point vertical take-off gear as fulfilling the requirements of the ROG rule, while the enforcement of the rule itself, at any specific meet, is at the discretion of the contest director and hand-launching may be substituted if conditions should recommend it.

Great Britain

As a result of the drastic changes proposed under the 1957 FAI rules, there is a possibility of the emphasis shifting from 2.5 cc. (.15) motors to something smaller. Up to the present, the .15's have featured the highest specific power outputs in the up to .15 cu.in. classes, with figures such as 124 bhp/litre (Oliver Tiger III), 120 bhp/litre (Webra Mach-1) and 113 bhp/litre (Super-Tigre G.20 and Torp 15). In the 1.5 c.c. (.09) group, both the Oliver Tiger-Cub and Elfin 1.49BR substantially exceed 100 bhp/litre, but no other small motor has, up to the present time, bettered the 100 bhp/litre figure. The half-A's range from about 50 to 95 bhp/litre.

Now, a new motor has appeared in England of only 1 c.c. (.061 cu.in.) which actually delivers a power output equivalent, per unit of piston displacement, to the hotter 2.5's. This is the Allen-Mercury 10 Diesel and a first production example which we have just been testing reached an output of just under .12 bhp at 14000 rpm—equal to nearly 120 bhp/litre. The advance that this represents over previous 1 c.c. engines (a popular displacement class in Europe, incidentally) can be judged from the fact that it is nearly twice as good as the output of the widely used E.D. Bee engine and exceeds, by more than 20 percent, the previous highest authentic bhp figure for a 1 c.c. engine, which was reached by the Norwegian David-Andersen Diesel.

Allen motors (the firm also makes .15 and .21 Diesels which, however, are of normal average performance) are produced in small numbers at Edmonton, just outside London. The Allen-Mercury 10, itself, is a normal shaft-valve, radial-port motor, to which nothing more than some of the known lessons of miniature Diesel design and construction have been intelligently applied. The motor makes few concessions to lightness: where plenty of metal is required in the interests of strength, rigidity or cooling, it is used. The cylinder liner, for example, is of quite exceptional wall thickness (5/64 in.) and is flanged at the exhaust belt, where it seats in a recessed section of the crankcase. It is axially clamped, via a closely fitting finned outer barrel, by means of three through-bolts into the case casting, all of which adds up to rigidity, freedom from risk of distortion and the effective dissipation of heat. A good compromise on porting, adequate and well fitted bearings and a convergent cylinder bore are both factors contributing to the performance of this well-balanced design.

Western Germany

Yet another new line of rc equipment has just been announced in Germany. This is the "OMU" range. Additional to the existing OMU-105 outfit are an entirely new range of components known as the OMU-115 series, plus a new crystal-controlled transmitter known as the model 117q. The 115 outfit includes the 115s transmitter of standard circuit design, employing the popular 3A5 tube, for use with which yet another German transistorized

New German Roboter-1000 transmitter. This outfit features another transistorized receiver.

Israel's Nordic team, L to R—Hermelin, Kobo, Levi, Ben-Shalar. Finals will be held in Italy.

receiver makes its appearance: the 115e, this time using an XFG-1 gas tube along with an OC.71 transistor. The relay is a Siemens 151x and a 45 volt B supply is specified. The 117q crystal controlled hand transmitter (27.12 mc.) uses a DL.94 (3V4) tube and operates on a 100 volt B supply.

Israel

On March 23/24, the third and final eliminators were run off at Tel-Aviv for Israel's team for the World Glider Championships to be held in Italy in October. Naftali Kadmon, chairman of the Aeromodelling Section of the Aero Club of Israel will be team manager and reserve man. System of team selection was interesting. First eliminator was held December 1955, which, however, was not a qualifier for the second eliminator held in February. First five place men from each of these two contests then competed in the final eliminator, which consisted of ten rounds spread over two days. Advantages claimed were that while team selection was not decided by the luck element of one eliminator, good modelers who, for any reason beyond their control, could not attend both preliminary eliminators, would still have a chance of qualifying for the final team selection.

Interesting from Israel also, was the method used in distributing the 65 German Webra motors which, as we reported earlier in this column, were lately imported by the Ae.C.I. In order that the motors should go to the most deserving members, only those with a satisfactory record with gliders and able to show a high standard of workmanship were eligible. Moreover, each applicant had to carve a good replica of a prop supplied to him (to ensure that the motor would not be grounded should the original prop get broken) and also had to write a short essay on motor operation and maintenance (!!!). Each successful candidate for a motor was then required to pay a deposit of around six to eight dollars, the motors actually remaining the property of the Ae.C.I. Our youngsters don't know how lucky they are, do they?

Indonesia

Wide representation in Indonesia's National Championships was apparent, with teams from Bandung, Djakarta, Jogjakarta, Solo, Surabaja, Malang, Semarang, Palembang and Medan. With f/f gas, towline glider and a beauty event as points scoring events, the "Aviantara" team from Bandung proved easy winners by taking two firsts and a second. F/F events were to 3 x 5 min. rules and the top men in the gas and glider events totalled 13:56 and 15:00 respectively. It is good to see the hobby catching on in places where, only a few short years ago, there was virtually no model building at all.

(*Continued on page* 45)

Contest Calendar

Enter or visit these meetings during your vacation. Talk shop with fellow hobbyists.

JULY

1—*Chicago Ill.:* Class AA 4th Annual Chicago Prop Nutz Flying Meet for OHIC, OR, TLG and FFG. Peter J. Sotich, C.D., 3851 W. 62nd Pl., Chicago 29, Ill.

1—*Boone, Iowa:* Class AA 2nd Annual Boone Buzz Bugs' Model Meet for FFG, TLG, CLS, CLC, CLFS and RC. Harold W. Thies, C.D., 1406 Monona St., Boone, Iowa.

1—*Tulsa, Okla.:* Class AAA 3rd Annual Nordic Championship Contest for TLG. Willard H. Kehr, C.D., 4940 N. Johnstown, Tulsa, Okla.

1—*Collegeville, Pa.:* Class AA Cross Key Hawks' 2nd Annual Meet for TR, CLC, CLS, CLFS, NC, CL and destruction derby. Harry W. Hallman, C.D., 2000 Markley St., Norristown, Pa.

1—*Minneapolis, Minn.:* Class AAA 8th Upper Midwest PAA Load Meet for PL, TLG, jetex and RC. Walt Billett, C.D., 4 West 26th St., Minneapolis, Minn.

1—*Celina, O.:* Class AA Flying Hornets Model Plane Contest for CLS, CLC, RC, and FFG. W. E. Klosterman, C.D., R. R. 6, Celina, O.

1—*Cleveland, O.:* Class AA 2nd Annual Radio Control Meet. John W. Grega, C.D., 355 Grand Blvd., Bedford, O.

1—*Syracuse, N. Y.:* Class AA Meet. Pending.

7-8—*Buffalo, N. Y.:* Class AA 2nd Annual Radio Conference of Buffalo. Harold C. Keller, C.D., 39 Lorfield Dr., Snyder 21, N. Y.

8—*Washington, D. C.:* Class AAA National Capital Model Air Show for CLS, CLC, CL, TR, obstacle course, FFG, PL, OR, OHLG, RC CC and clobber. Bob Kirwan, C.D., 4305 16th St. S. #2, Arlington 4, Va. Pending.

8—*Spartanburg, S. C.:* Class AAA 8th All Dixie Championships for CL, TLG, OHLG, FFG, CLS, CLFS, CLC and RC. Robert S. Gaddis, C.D., 114 Wrightson Ave., Spartanburg, S. C.

8—*Pittsfield, Mass.:* Class AA 5th Annual Berkshire Model Plane Meet for CLS, CLC, TR and beauty. Robert L. Elliott, C.D., P. O. Box 278, Pittsfield, Mass.

8—*Omaha, Neb.:* Class AA Omaha Aeroneers' Model Airplane Contest for FFG, TLG, CLS and CLC. Jerry Bahula, C.D., 6933 Pinkney St., Omaha 4, Nebr.

8—*Mankato, Minn:* Class AAA Mankato Exchange-Mankato Modeleers Model Meet for FFG, FFFS, TLG, CL, CLFS, CLS, CLC and RC. William B. Thomas, C.D., Box 713, Lake Crystal, Minn.

8—*Farmington, N. Y.:* Class AA 3rd Annual Long Island Industrial Championships for CL, CLS, beauty, CLC and NC. Arthur F. Wardell, C.D., 2 Hunt Place, Bethpage, N. Y.

8—*Milan, Mich.:* Class AA Milan 2nd Annual Model Plane Meet for FFG, CLS, CLC and RC. David R. Maricle, C.D., 148 W. Main, Milan, Mich.

8—*Lansdale, Pa.:* Class AA 3rd Annual Model Airplane Contest for CLS, CLC, TR, RC, FFG, destruction derby and OR. Eva Biddle, C.D., P. O. Box 85, Neshaminy, Pa. Pending.

8—*Cincinnati, O.:* Class A Radio Control Contest. Restricted to residents of Cincinnati and vicinity. Gerhard A. Vogeler, C.D., 2873 Carroll Drive, Cincinnati, O.

14-15—*Spartanburg, S. C.:* Sky Knights' Record Trials for all free flight and control line classes. Robert S. Gaddis, C.D., 138 Morgan Square, Spartanburg, S. C.

15—*Evansville, Ind.:* Class AA 10th Annual Model Flying Circus for CLFS, CLS, CLC, CL and non-flying scale. Herman W. Berning, C.D., 2012 Conlin Avenue, Evansville, Ind.

15—*Hartford, Conn.:* Class AA Greater Hartford Model Plane Meet for CL, CLS, CLFS and CLC. Eugene P. Karambay, C.D., 30 Parker St., Newington, Conn.

15—*Waukesha, Wisc.:* Class AA 3rd Annual Lakeland Radio Control Contest. William J. Deffner, C.D., 234 Greenfield Ct., Waukesha, Wisc.

15—*Orangeburg, S. C.:* Class AAA 2nd Palmetto Regional Championships for CL, TLG, OHLG, CLS, CLC, CLFS, RC and FFG. Lary Bly, C.D., P. O. Box 744, Orangeburg, S. C.

15—*Watertown, N. Y.:* Class AA Meet for FFG, TLG, OR, OHLG and flying scale. Amos H. Harvey, C.D., R. D. #2, Marcy, N. Y.

15—*Camden, N. J.:* Class AA Highway Glo-bugs' 3rd Annual Team Race Meet for TR, CLC and destruction derby. George Moir, C.D., Main St.,

Mantua, N. J.

15–*Arcadia, Calif.:* Class AA FAI Class Team Racing Contest. Les McBrayer, C.D., 101-B Elm St., Alhambra, Calif.

15-20–*Houston, Tex.:* Air Force World Wide Model Airplane Championships. Restricted to qualified USAF personnel.

17–*Arecibo, Puerto Rico:* Class AA Superior "70" Model Airplane Contest for CLS, CLC, CLFS. Francisco Badrena, C.D., 595 Hostos Ave., Urb. Baldrich, Hato Rey, P. R.

22–*Perth Amboy, N. J.:* Class AA Combat Olympics for CLC. Adam Ginda, Jr., C.D., 21 Omaha Dr., Cranford, N. J.

22–*Toledo, O.:* Class AAA Second Midwestern Radio Control Regional Model Airplane Contest. Kenneth R. Herrick, C.D., 726 Sherman, Toledo, Ohio.

22–*Dublin, Va.:* Class A Clayter Lake Model Circus for CLS, CL, CLC, TR and RC. Restricted to those invited. Craig S. Riggle, C.D., 88 W. Main St., Pulaski, Va.

22–*Kohler, Wisc.:* Class AA 5th annual Free Flight Meet for OR, OHLG, TLG, RC. Wilbur A. Lea, C.D., 1030 No. 14th St., Sheboygan, Wisc.

22–*Winston-Salem, N. C.:* Class A RCLNC Flying Session for RC. Restricted to members of RCLNC. Ralph N. Corelle, C.D., 834 Fairmont Ave., Salisbury, N. C.

22 & 29–*Ann Arbor, Mich.:* Class AA Ann Arbor Airfoilers and Exchange Club Contest for OHLG, FFG, OR, RC, CL, CLS, CLC and CLFS. Albert L. Temple, C.D., 9971 Doris, Livonia, Mich. Pending.

23-29–*Dallas, Tex.:* Class AAAA National Model Airplane Championships. For information and entry blank, write AMA Headquarters, 1025 Connecticut Ave., N. W., Washington 6, D. C.

29–*Fresno, Calif.:* Fresno Gas Model Record Trials for FFG. Jim Scheidt, C.D., 2225 Brown, Fresno, Calif.

29–*Largo, Fla.:* Class AA 1st Largo Prop Twisters' Model Contest for CLC, CLS and CL. Claude J. Rinehart, C.D., 711 2nd St., S. W., Largo, Fla.

AUGUST

5–*Fond du Lac, Wisc.:* Class AA Fond du Lac Glo-Bugs' 2nd Annual Airplane Meet for CLS, CL and CLC. B. A. Zuehlke, C.D., 385 E. 18th St., Fond du Lac, Wisc.

5–*Portland, Ore.:* Class AA Portland Fireballs Annual U-Control Contest for CLS, CLC, CL, CLFS and rat racing. Loren L. Schnell, C.D., 5206 N. E. 31, Portland 11, Ore.

5–*Bridgeton, N. J.:* Class AA Bridgeton Model Airplane Club, 2nd Annual U-Control Meet for CL, CLC, CLS and scale-beauty. Charles H. Errickson, C.D., 31 Walnut St., Bridgeton, N. J.

5–*Frederick, Md.:* Class AA 3rd Annual Model Airplane Contest. Morris Rhian, C.D., 1515 Rosemont Ave., Frederick, Md. Pending.

5–*Harvey, Ill.:* Class A R/C3 Flying Meet for RC. Restricted to members of Radio Control Club of Chicago. R. E. Webb, C.D., 1303 W. 79th St. (1621 E. 87th St. after June 1), Chicago, Ill.

5–*Lakehurst, N. J.:* Indoor Record Trials for all indoor classes. Anthony J. Becker, Jr., C.D., 2212 Griffith St., Philadelphia 15, Pa.

11-12–*Wichita, Kans.:* Class AAA 3rd Annual Wichita Radio Control Club Meet for RC. R. E. Etherington, C.D., 926 N. Pinecrest, Wichita 6, Kans. Pending.

12–*DeKalb, Ill.:* Class AAA Flying Circus for FFG, OR and RC. Dutch Hess and Dale Hindenburg, C.D.'s, 137½ E. Lincoln, DeKalb, Ill.

12–*Winfield, Kans.:* Class AA "Y" Wichihawks' 4th Annual Free Flight Meet for FFG, OR, TLG and OHLG. R. Ray Combs, Jr., C.D., 8326 E. Gilbert, Wichita, Kans.

12–*Johnsville, Pa.:* Class AAA Bucks County Federation of Model Airplane Clubs Contest for PL, FFG, OHLG, TLG, OR, TR, NC, CLS and CLC. Tony Becker, C.D., 2212 Griffith St., Philadelphia 15, Pa.

12–*West Palm Beach, Fla.:* Class AA Palm Beach Spindizzies' Model Airplane Meet for rat racing and CLC. Albert C. Bursey, C.D., 3024 Clyde Rd., West Palm Beach, Fla.

12–*Alliance, O.:* Class AA Alliance Exchange Club Model Contest for FFG, FFFS, CLS, RC. Edward P. Cross, C.D., 23 E. State St., Alliance O.

12–*Dallas, Tex.:* Class AA Cliff Model Club 3rd Quarterly Contest for FFG and OHLG. Joel B. Hargis, C.D., 1102 W. Saner Ave., Dallas, Texas.

12–*Waterbury, Conn.:* Class AA Waterbury Model Meet for CLS, CLC and jalopy racing. John C. McKee, C.D., 374 Knollwood Circle, Waterbury, Conn.

17-19–*Detroit, Mich.:* Class AAA Great Lakes Radio Control Meet. E. S. Kratzet, C.D., Box 5197, Grosse Pointe 36, Mich.

17-19–*Atlanta, Ga.:* Class AAA Greater Southeastern Model Airplane Meet for CL, CLS, NC, RC, FFG, CLC, CLFS, TR, OHLG, TLG, OR and rat racing. Lloyd Wason, C.D., 315 Church St., Decatur, Ga.

18–*Union, N. J.:* Class AA Union Model

Airplane Invitational Meet for CLS, CL, CLC, beauty, TR and NC. Adam J. Karp, C.D., 625 18th Ave., Newark, N. J.

18-19—*Omaha Nebr.:* Class AA 2nd Annual OmaHawks' R/C Contest. Robert A. Johnson, C.D., 4326 North 52nd St., Apt. 2, Omaha, Nebr.

19—*Hempstead, N. Y.:* Class AA 1st Annual Nassau Police Boys' Club Model Contest for CL, TR, NC, CLC, CLS, CLFS and PAA Load control line endurance. Arthur F. Wardell, C.D., 2 Hunt Pl., Bethpage, N. Y.

19—*Manitowoc, Wisc.:* Class AA Air Pirates' 4th Annual Meet for CLS, CLC, CLFS and CL. Robert F. Maciejewski, C.D., 120 Cleveland Ave., Manitowoc ,Wisc.

19—*Kokomo, Ind.:* Class AAA North Central Indiana Control Line, Championships for CLC, CLFS, CL and CLS. Joe Braun, C.D., 1603 Haynes Ave., Kokomo, Ind.

19—*South Bend. Ind.:* Class AA South Bend Buzz Bugs and Exchange Club Meet for FFG, OR, OHLG and RC. Jack W. Greene, C.D., 1143 E. LaSalle, South Bend 17, Ind.

19—*Inglewood, Calif.:* Class AA Skywolves' Rat Race. Don C. Crystal, C.D., 805 E. Palmer Ave., Compton, Calif.

19—*Peoria, Ill.:* Class AA Illinois Valley U-Control Championships for CLS, TR, CLC, CLFS, CL, balloon bursting and RC. Morgan Baldridge, C.D., 418 S. Adams St., Peoria, Ill.

19—*Albany, N. Y.:* Class AA 1st Annual Albany Flying Modelairs Meet for CLS, CLC, CLFS, CL and beauty. Albert L. Hurd, C.D., 39 Dove St., Albany, N. Y.

25-26—*Des Plaines, Ill.:* Class AAA 1956 Illinois Jaycee Gas Model Airplane Meet for FFG, RC, CL, CLS, CLFS, CLC and TR. Restricted to residents of Illinois. Peter J. Sotich, C.D., 3851 W. 62nd Pl., Chicago 29, Ill.

25-26—*Amarillo, Tex.:* Class AAA 2nd Annual Jaycee Model Contest for rat racing, CLS, CLC, FFFS, CLFS, static scale, CL, FFG, OHLG, TLG, RC and PL. James F. Pierce, C.D., 2607 W. 22nd St., Amarillo, Tex.

26—*Cordova, Ill.:* Class AA 3rd Annual R.I.M.A.C. Free Flight Contest for FFG, OHLG, TLG and OR. John I. Murphy, C.D., 4105 14th Ave., Rock Island, Ill.

26—*Fresno, Calif.:* Fresno Gas Model Record Trials for FFG. Jim Scheidt, C.D., 2225 Brown, Fresno, Calif.

26—*Cleveland, O.:* Class AA 9th Annual ½A Free Flight Contest for FFG. John W. Grega, C.D., 355 Grand Blvd., Bedford, O.

26—*Detroit, Mich.:* Class AA 10th Annual Model Plane Contest for CL, CLFS, CLS and CLC. Warren E. Bartlett, C.D., 14515 Asbury Park, Detroit 27, Michigan.

26—*Waynesboro, Pa.:* Class AA Pennsylvania State Approved Junior Championships for OHLG, ½A FFG, CLC and OR. Restricted to Junior flyers of Pa. Bernard Kessler, C.D., 18 Mulberry St., Waynesboro, Pa. Pending.

26—*Clearwater, Fla.:* Class AA 2nd Annual Central Pinellas Exchange Club Contest for CLC, CLS, CLFS and CL. Claude J. Rhinehart, C.D., 711 2nd St., S., W., Largo, Fla.

26—*Beverly, Mass.:* Class AA 3rd Annual New England R/C Championships. John K. Ross, C.D. For info: Les Wilson, 1 Short St., Bedford, Mass.

26—*White Plains, N. Y.:* Class AA Exchange Club's 2nd Annual Model Aviation Meet for ½A FFG, RC, CLC, CLS, OR and OHLG. A. E. Lehmberg, C.D., North Salem Rd., Ridgefield, Conn.

26—*Marion, Ill.:* Class AA 13th Marion Lions Club Model Airplane Meet for FFG, OR, TLG, RC, CLS and CLC. Edward H. Aikman, C.D., 1020 N. Market St. Marion, Ill.

26—*Los Angeles, Calif.:* Class AA 7th Annual Inglewood Flightmasters Free Flight Scale Contest. Robert E. Moncrieff, C.D., 2108 Santa Fe Ave., Torrance, Calif.

Poor Man's Multi-Control

(*Continued from page* 29)

basin was filled with water and in went a completely wired up bench rig of cascaded VariComps and motor control unit! All controls were keyed and the system worked perfectly!

It's interesting to note that an RME system could be rigged up in several ways with just one escapement in place of cascading two, but this was not chosen as a production item because the model would "jump" in flight between controls, and there would be a longer time lapse between repeated lefts and repeated rights, as all control would have to cycle through instead of just the rudder.

About R.C. Boats

(*Continued from page* 37)

idea of being able to apply just the amount of rudder movement you want instead of all or nothing, then pulse is the answer for you. By adding a control box to the keying lead you turn the transmitter on and off in pulses. The on and off *ratio* can be varied from full on to full off with on and off being 50-50 in the center or neutral position. Changing the pulse *rate*, the amount of time the signal is on or off, gives the secondary controls.

Quite a few pulse boxes are made commercially and quite a few designs for home construction have appeared in print in the past few years. Not much equipment is made in this country to use the pulse system in boats. The magnetic actuators used in planes lack the muscle for all but the smallest, slowest boats.

Polk's imports two actuators from England for use with pulse systems. Both the Ripmax steering unit and the ED rudder mechanism work the same way. A block with a projecting pin moves along a threaded rod which is rotated by a small motor when the current is switched on. Rotation is in either direction—rudder movement is thus non-sequential and infinitely variable. The Ripmax control box has two push buttons, green for a signal on, red for a signal off; with both buttons up, the signal is sent only half the time,

(*Continued on page* 44)

BABCOCK *FIRST AGAIN!*

TONE MODULATED
COMPLETELY TRANSISTORIZED
RADIO CONTROL

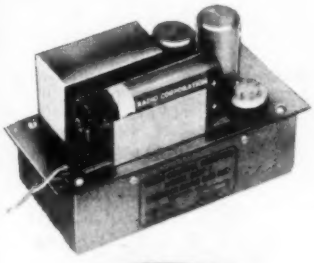
465 MC

AMERICA'S FIRST INTERFERENCE-FREE RECEIVERS!

COMPLETELY TRANSISTORIZED
LIGHTEST INSTALLED WEIGHT
MODERN PRINTED CIRCUITS

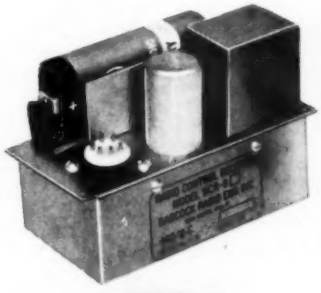
Who in the world, but BABCOCK, should be first to introduce a *completely transistorized* receiver (no tubes!) . . . the *first* and *only* tone modulated receiver operating on 465 mc?

Now even the beginner can use radio control with complete confidence of success because of the simplicity of installation and operation . . . *the fail-safe reliability* of these new 465 mc receivers.



$69.95

BCR-7 RECEIVER



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BCR-8A or 8B RECEIVER

- INTERFERENCE-FREE — The result of tone control frequencies higher than ever before used in model radio control.
- Exceed Military Standards of reliability
- Hermetically sealed relays and filters — no tuning adjustments — safe from damage by rust, moisture or oil
- Lowest installed weight, 8 oz. for BCR-8 and 10 oz. for BCR-7, *including battery*
- With BCR-7 Two Channel Receiver, both channels may be used separately or simultaneously
- Lowest battery cost and consumption of any receiver
- *Use modern printed circuits*
- Materials for installation furnished without additional cost

BCR-7 TWO CHANNEL RECEIVER	$69.95
BCR-8A or 8B SINGLE CHANNEL RECEIVER	$39.95

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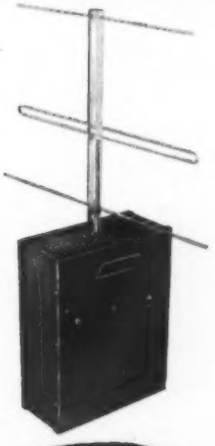


$ 69.95

BCT-7 TRANSMITTER

F.C.C.
TYPE APPROVAL
NO. CR-425

After more than two years exhaustive research and testing in all conditions and environments . . . Babcock's new BCT-7 Transmitter is setting new standards for radio control.

The most modern and efficient U.H.F. transmitter ever designed — the BCT-7 is a result of Babcock experience with Military development.

- First and only 465 modulated tone transmitter on the market
- Two modulation tones may be used independently or simultaneously
- Three element antenna gives super-radiation efficiency
- Military type and grade of construction
- Line stabilized 465 mc R F section
- BABCOCK QUALITY and RELIABILITY you have learned to expect

on and off in even spaces.

In the boat, the receiver relay, clicking back and forth, reverses the polarity of the current to the motor in the steering unit. As long as the pulses are equal and opposite, it takes one step forward and one step back, thus staying right where it is.

Pressing one of the buttons causes the relay to pull in on one side, allowing the motor to rotate and moving the rudder to that side. Limit switches keep the block from jamming when it's full over. Releasing the button leaves the rudder where it was when you released the button. To get the rudder back midship, calls for a press on the opposite button. With this system in a fast boat, quite good control can be maintained since small corrections in heading can be fed continuously. Care must be exercised, however, because it is not self-neutralizing.

Another English import from Polk's is the Fenners-Pike servo unit, a compact little full-proportional unit. Through an ingenious hook-up including a dual rheostat inside the case, any deflection of the handle of the matching control box produces a proportional movement of a lever on the servo.

This means, control lever left—rudder left. Control lever right—rudder right. Control lever centered—rudder amidship. Added to this are the second control contacts which are closed by pulse rate charge, by pressing a button on the control box. The second control can operate an air-bleed motor control or DMECO servo and Bramco throttle. And that's quite a bit of control for one channel.

Except for the Fenners-Pike, there are no other proportional servos on the market today with a means of getting a second control built in. Home-made is the answer here. Quite a few circuits have been published for pulse rate discriminators. They all work about the same way. The pulse rate is doubled or tripled. The pulses are received, rectified and amplified and fed to a secondary relay. At the slow rate, the rectified current is not high enough to pull the relay in. At the high rate, the relay pulls in controlling the secondary gear. Since the ratio of on to off remains the same at either rate, the rudder stays where it is and steering is not affected. The pulse rate change system gives a lot of flexible control for only one channel, but it is tricky to adjust and maintain.

If money is no object, tone is the deal for you. For approximately $150 to $220 and up, you can get all the control you can use such as two, three, five and six tone units. With a six-tone set-up, there are six buttons on the control box, one for each tone transmitted. In the receiver,

there are six relays working through reeds or filters which sort out the tones from the transmitter. Using a compound on one tone or a semi-proportional servo on two tones still leave a lot of tones for cascaded escapements, steppers and multi-servos. The number of controls you can set up with a deal like this runs into very large numbers.

The kit and equipment manufacturers have done a yeoman job of making it easy for you to get into the R/C boat field. Try a medium kit boat and simple radio gear in your first effort. Then go after the big ones!

Foreign Notes

(*Continued from page* 39)

Czechoslovakia

The Czech MVVS model research center at Brno, noted for the record breaking speed motors produced under its auspices, is now developing rc gear. Prototype receiver seen used three hard tubes. Probably follows established circuit design. Difficulties are reported with tubes, characteristics of which are said to vary considerably.

Yugoslavia

The only motor at present made in Yugoslavia is the "Aero" Diesel. Designed by Ing. R. Miloradovic and produced by the Aeromodelling Institute in Belgrade, about a thousand of these motors have been built to date. Made in wo models, the 150 (.09 cu. in.) and the 250 (.15), they are conventional shaft, annular port motors and are nicely constructed.

France

From the USAF Chad Model Airplane Club in Central France comes a request for contact with French model builders in that area. Any interested French enthusiasts are requested to write to this column, c/o M.A.N.

Italy

We hear that Super-Tigre have two hot new ball-bearing Diesels on the way, an .09 and a .15. Probably aimed at achieving same top-line performance in free-flight as the Super-Tigre glow .15 has achieved in c/1 speed.

Obituary

It is with regret that we have to report the passing of the noted German aerodynamicist, Ing. F. W. Schmitz. Ing. Schmitz was known and respected in Europe for his contributions to the more serious side of model design through his work at the Gottingen research center. Much of the recent swift rise of German international contest performance can, in fact, be traced to the experiments of such noted exponents as Max Hacklinger, initiated and encouraged by the investigations of Ing. Schmitz. We are glad to learn that his work is to be carried on in good hands.

The Flanger

(*Continued from page* 30)

cized sanding sealer (mix 10 drops castor oil in bottle of sealer) on the tail. Sand well after each. Put three coats of plasticized sealer on the wing and fuselage, then lightly color dope the wing tips and fin. Wax and polish the wing and tail. This assures that you can fly in dewy or rainy weather and not have the stabilizer warp. And, many times these ships have remained in sight only because of periodic flashing as the sun glinted off well polished surfaces.

WEIGHT: First the balance. Use sheet lead or solder. A spot of clay for fine trim. Keep nose bulk to a minimum.

The flying weight. A heavy Flanger (1.3 to 1.4 oz.) will climb higher and handle better in the wind. The lighter

model (.80 to 1.0) is suitable for indoor flying in dirigible hangers. Or for riding ground bumps, light air. It's good to have both kinds.

PRE-ADJUSTMENTS: Make these adjustments after building: 1/16 in. left rudder; 1/16 in. down-elevator on left side of stabilizer; 3/32 in. wash-in (warped down) on left wing center panel. If you don't have a heat lamp, use your thumb nail to crease the rear ⅜ in. of the tip dihedral joint. Then slightly crack this and the trailing edge to about half way inboard. Use a thin layer of cement to hold it. I have them fly right off the building board with these trim settings.

FLYING: Have you seen the guy who goes galloping across the field, makes a broadjump, anl then, completely uncoordinated, flops the glider into the air? It ain't necessary! You can actually do a pretty good job of throwing from a solid standing position. However I find it best to lead with your left foot and take one or three steps. You have a tight grip on the glider. Your arm is going back as you start the last step. Use your whole arm, but you must snap your wrist as you release. Push the finger rest to full advantage. Throw up-up-up. That is where you want the glider to go.

In HL Glider, more than in any other event, the pull-out is important. The variables which influence this are: Angle of launch, degree of bank, rudder deflection, wind, and intensity of the throw. You must learn to control or account for all of these. Most of this can be accomplished by flying, flying, flying.

Don't compromise and throw off-wind to achieve a pull-out. You won't get the altitude. Make adjustments so that you can throw directly into the wind.

FLIGHT PATHS: First with light throws up and to the left, establish a safe smooth glide circle. If it wants to come in on the left wing take a little left rudder out. Check for fuselage warp. Add a bit more wash-in on the left wing. (Don't overdo) Use this procedure just described whenever you have spiral instability.

Medium throws next will confirm glide circle. On hard launches, if it chases all over the sky in tight maneuvers, you need more down-elevator. If it swoops too much to the right on launching, give more left rudder or decrease wash-in on left wing, or throw more upward.

Here are two types of climb that I use: It goes up to the right making one turn, rolls left at the very top and clicks into the glide turn. I prefer the next one for turbulent weather. It climbs out in a shallow turn (but at a high launching angle). It usually makes just one turn all the way up. The nose just goes over the top as it slows down, and rides into a smooth glide. The nice thing about this adjustment is that the model will take the hardest throw and still pull out over the top. This is important for contest work your arm will be somewhat cold on the first flights, but will limber up as the day progresses. The resulting change in intensity of throw will very probably leave the glider hanging straight up with no forward speed. (Because an extremely hard throw will carry it past the usual pullout point.) Note the last flight path. With this the model converts extra energy into just a little more circle in the climb. I've been pretty thorough on this because you see so many ships with this trouble.

SOUND: Listen for the "dirty" glider which whines and moans on its way up. The sound is impressive but the climb usually not. You must pay for this type of noise in drag, wasted energy. The very best

(*Continued on page* 48)

here are the WINNERS!

1955 NATIONALS
Los Alamitos, Cal.

Again, for the fourth time, Top Flites and Power Props won *more* events in the Nationals *than all the other makes combined*. Fly with a sure winner!

A pair of Top Flite winners from Yuba City, Calif. GARY GRENOBLE (left) beat the best in ½A F.F. JR with his Shorty. Swung a 6-3 POWER PROP on his Atwood .049 with Ohlsson Gold Seal go-juice. Time, 16:34. DAVID ARNE bagged first in A F.F. JR with an Ohlsson Gold Seal 2000 bang-watered Cub .09. His Jasco Rival clocked 14:00 behind a 7-4 TOP FLITE to make him Junior National Champ!

½ A SPEED JUNIOR
Michael Obryan
Detroit, Mich.
Speed 73.95mph
Engine Thermal Hopper
Fuel Home Brew
PROP 4½-7 POWER PROP
Plane Original

A GAS F.F. OPEN
John D. Nogy
Denver, Colo.
Time 18:00
Engine Atwood .051
Fuel K&B 1000
PROP 6-3 POWER PROP
Plane Jasco Streak

C GAS F.F. JUNIOR
Jack Linn
Los Angeles, Calif.
Time 16:36.0
Engine Torp 32
Fuel Ohlsson 200
PROP 10-6 POWER PROP
Plane Modified Zeek

PAA-LOAD OPEN
L. T. Everett
Long Beach, Calif.
Time 14:25.2
Engine Thermal Hopper
Fuel Thimble Drome Racing
PROP 6-3 POWER PROP
Plane Payee

INT'L PAA LOAD JR-SR
Robert Patchin
Hawthorne, Calif.
Time 11:42.3
Engine Torp 15
Fuel Thimble Drome Racing
PROP 8-3½ TOP FLITE
Plane PAA-Sir

STUNT OPEN
Bob Palmer
Burbank, Calif
362 points
Engine Veco 35
Fuel Exothermic 28
PROP 10-6 TOP FLITE
Plane Thunderbird

FLYING SCALE SENIOR
Jim McCroskey
Iredell, Texas
294 points
Torp 29 engine
Fuel Fox
PROP 9-5 TOP FLITE
Plane F-51

B GAS F.F. JUNIOR
Bob Johnson
Riverside, Calif.
Time 14:07.8
Engine Fox 29
Fuel K&B 1000
PROP 10-6 TOP FLITE
Plane Modified Spacer

PAA-LOAD ENDURANCE
Richard Heist
Fort Worth, Texas
Time 1 hr. 8 min. 14.6 sec.
Engine Torp 15
Fuel Powermist
PROP 8-6 POWER PROP
Plane So-Long-Gone

½ A SPEED SENIOR
Mike Dawson
Galesburg, Ill.
Speed 79.29 mph
Engine Thermal Hopper
Fuel Thimble Drome Racing
PROP 4½-6 POWER PROP
Plane modified Whirlaway

FLYING SCALE OPEN
Thomas Dean
Corpus Christi, Texas
344 points
Engine Cameron 19
Fuel K&B 1000
PROP 9-6 TOP FLITE
Plane Aeronca Crop Duster

B GAS F.F. SENIOR
Hub Gelvin
Topeka, Kansas
Time 16:56
Engine Torp 23
Fuel K&B 1000
PROP 10-3½ TOP FLITE
Plane Spacer

FLYING SCALE F.F. JR-SR
Hubert Gelvin
Topeka, Kansas
85 points
Engine Wasp .049
Fuel K&B 1000
PROP 5-3 POWER PROP
Plane Longster "Wimpy"

COMBAT JUNIOR
Michael Burke
Louisville, Ky.
520 points
Engine K&B 35
Fuel Exothermic 28
PROP 10-6 POWER PROP
Plane mod Trixter Profile

NAVY CARRIER SENIOR
Clyde Hamilton
Bellflower, Calif.
377.47 points
Engine Torp 35
Fuel K&B 1000
PROP 9-6 POWER PROP
Plane Grumman Guardian

C GAS F.F. SENIOR
Don Geisler
Monterey Pk., Calif.
Time 27:26.0
Engine Torp 32
Fuel K&B 1000
PROP 10-6 TOP FLITE
Plane Civy Bdy 61

FLYING SCALE F.F. OPEN
Bob Hill
Capistrano Beach, Calif.
213 points
Engine Atwood .049
Fuel K&B 1000
PROP 6-3 TOP FLITE
Plane Berkeley Sup. Cruiser

COMBAT SENIOR
Jim Leverett
Glendale, Calif.
560 points
Engine Fox 35
Fuel V&O
PROP 9-6 POWER PROP
Plane Original

NAVY CARRIER OPEN
R. M. Post
Fresno, Calif.
391.93 points
Engine McCoy 29
Fuel Powermist
PROP 9-7 TOP FLITE
Plane Grumman Guardian

R.O.W. GAS JUNIOR
Jack Moreland
Long Beach, Calif.
Time 12:31
Engine Space Bug .049
Fuel Thimble Drome Racing
PROP 6-3 POWER PROP
Plane Orig. by J. Osley

RADIO CONTROL (rudder)
Edward L. Friend
Las Cruces, N. M.
76⅔ points
Engine Fox 25
Fuel Olhsson 200
PROP 11-4 TOP FLITE
Plane Live Wire Crusier

COMBAT OPEN
Donald R. Smith
San Bernardino, Calif.
540 points
Engine Fox 35
Fuel K&B 1000
PROP 10-6 POWER PROP
Plane ½ Fast

½ A GAS F.F. SENIOR
Don Alberts
Albuquerque, N. M.
Time 36:00
Engine Atwood .049
Fuel Thimble Drome Racing
PROP 5¼-4 POWER PROP
Plane Privy Boy

R.O.W. GAS SENIOR
Jack Thomas
Garden Grove, Calif.
Time 12:58
Engine Torp 15
Fuel Home Brew
PROP 10-6 TOP FLITE
Plane Modified Spacer

RADIO CONTROL (multi)
Alex Schneider
San Francisco, Calif.
156⅔ points
Engine Spitfire 60
Fuel Gas & Oil
PROP 14-6 TOP FLITE
Plane Modified Piper Cub

FLYING SCALE JUNIOR
Gary A. Cummings
Fort Worth, Texas
183 points
Engine 2 Torp 32's
Fuel Cheminol #2
PROP 10-6 TOP FLITE
Plane B-26

NEW RECORD ½A SPEED
Jerry McClung
Abilene, Texas
Speed 79.24 mph
Engine Thermal Hopper
Fuel Thimble Drome Racing
PROP 4½-6 POWER PROP
Plane Mini-Whirlaway

HELICOPTER
Parnell Schoenky
Kirkwood, Mo.
213.79 points
Eng. Atw'd .049 & Jetex 350
Fuel Cheminol AA
PROP 6-3 POWER PROP
Plane XH-4 and JH-5

NEW! TOP FLITE PLASTIC PROPS
for *most* pull from ¼A engines
4 SIZES: 5¼-3, 5¼-4, 6-3, 6-4
Molded of break-resistant, mar-proof and fuel-proof plastic to give longer life, more flights and easier starting of ½A engines. Over a year of pre-market testing to insure that these new plastic props meet TOP FLITE'S high standards of precise engineering for higher performance . . . the "tops in props."

15¢ EACH

TOP FLITE

TOP FLITE MODELS, INC. • 2639-SOUTH WABASH AVE. • CHICAGO 16, ILLINOIS

sound is that of an extremely hard throw with a clean glider. It leaves with an almost ringing sound. And the slick whistle of air streaming over the wing is soon lost in altitude.

THE ART: As you become more interested in really good HL you will acquire a feeling for the bird. And therein lies the secret. Control. You must fly the ship so many times that you know what the climb path will be the instant it snaps from your fingers.

My method is to go out on a dead calm evening. Take two or three gliders. Try to get a similar adjustment on all of them. Make sure you can recognize each one at a glance by different colors or markings. Start throwing them up at thirty second intervals (handy to have a wrist watch with a sweep second hand). Keep gliders in the air continuously, as long as your arm holds out. By throwing on thirty or sixty second marks it is easy to spot the time on each landing. And it is a good workout. And you teach your arm to become versatile, to work under pressure like you find at a contest. You will gain control.

A word of caution on evening flying. Last summer some swallows came flitting over the area. Curious swoops to see what this stiff winged thing was invading their sky. A couple of them tried to settle into formation with the gliler. But it had a considerably lower rate of sink than the birds. They apparently got jealous because on the next flight the swallows attacked. One pass snapped the fin off clean. The poor Flanger came down in a flat spin the last hundred feet. The swallows received a few appropriate words!

CONTEST FLYING: For serious contest flying you must work on your arm like a baseball pitcher. And respect it by not throwing hard until you've warmed up.

When on the contest field you have to choose the best time to fly and the best place. A good starting rule is to watch for the time when the warm morning sun breaks up the ground inversion. (Usually rather early.) Shortly after there will be ground risers bumping all over the place. Good first flights of perhaps twice dead air time can be made without losing a model. This could last about an hour. After this period you will have to sniff out the thermals (and that is a story in itself). A good general rule is to stay out of downdrafts.

Always, unless your flights are all long, save a couple of throws for the end of the day. It's good insurance.

Be cautious of the marginal turn adjustment where a safe dead air glider spirals in upon encountering turbulent thermal conditions.

After all this talk you might think that HL is getting too serious. Well happily, it's a lot of fun just to go out on a warm day and give a glider a few light tosses and watch it bump around on ground risers. Coming just about as close to imitating nature's flying creatures as anything you can build.

The Blackburn Monoplane

(*Continued from page 9*)

Scale dihedral, which is slight, has been maintained, but it is supplemented by a unique arrangement for obtaining more dihedral when the plane is in a critical flight attitude. This is done by joining the wing panels together with the aid of metal band or 1/16" dia. wire fasteners, so that the wing flexes with varying lift loads.

For covering the model, we recommend light-weight Silkspan throughout or, if you prefer, Japanese tissue. However, we would not advise a heavier covering agent

unless performance is to be considered secondary to maximum durability. For a finish, apply four to five coats of thinned, cleared dope, rubbing down gently with fine sandpaper between coats. Use either Butyrate dope for all coats, or else three coats of nitrate dope, plus two of Butyrate. Butyrate is fuel proof.

The control cables and bracing, which are an important part of the model's scale beauty and authenticity, can be faithfully reproduced in whole or in part. We preferred to compromise this feature for the sake of lower drag and for practical purposes. Flying in a weedy area is rough on wire rigging! However, for those who are enthusiastic about rigging the model completely we have devised a little snap-out fastener which can be utilized for all the bottom bracing and cables. This will at least minimize the hazard of rough landings that would be troublesome were the model to have been rigidly braced.

For power, most any engine from .049 to .075 displacement (but not more!) will prove satisfactory. The original model weighed approximately nine ounces with an .049 and the performance was perfect.

Under the Red Shield

(*Continued from page* 13)

turn-over with nothing accomplished. Consequently, we keep a good supply and variety of the best engineered kits that can be found on the market.

Every boy who enrolls in our classes is considered a beginner. We do not require him to go through the beginner's course, if his capabilities prove this unnecessary. We allow advanced builders to make their own kits or designs, if that is the way they like it.

The beginner' series consists of 6 models. The 9- and 10-year old boys are supplied with an all-balsa glider, with pieces cut to length. Next is the build-up balsa and paper glider which they must cut, fit, and put together. After this, they are allowed to build a simple paper-and-balsa ROG, with five cut-out parts.

For boys from 11 years of age up, this same course applies in the beginning, unless their qualifications prove otherwise. They also build an additional advanced ROG, with cambered ribs. From this we make an exception as to "quickies" and permit them to build, as a breather, a Top Flight "Rascal" or like model.

These boys are required to make a completely built-up model, such as Jasco's Hawk, Falcon, or small Trooper tow-line glider. After this, the boy takes his choice of either free-flight, advanced models, or U-control, beginning with a "Stunt Runt" or like model. He continues to receive guidance in the selection of kits until this is considered no longer necessary.

In making our own beginners' kits, the cut-out parts are stamped on a balsa sheet. All of the wire parts, such as landing gear, rear hooks, propeller shafts, etc., are formed. The stamps are made by tracing the cut-out part on balsa, then carefully cutting this out, and gluing it on a small block, sanding the face of it smooth, afterwards giving it three coats of dope. Using a regular inked stamping pad, the parts can be stamped on balsa quickly and easily. The plans we use are printed from the original tracing by either a blueprint or whiteprint.

By using these kits, we are able to serve more boys on the budget allowed us. However, this has its limitations. First, it requires a great deal of time to keep these kits made up. Second, boys simply won't build these beyond a point. The main reason is prefabricated kits on the market which we cannot practically simulate.

Then, too, there is something about a nicely packaged kit that gives the first inspiration to tackle it. Consequently, we keep well supplied with these.

It is a real tragedy that the well engineered kit for the beginner, and slightly advanced modelers, is becoming a thing of the past, especially in the free-flight category, for there are thousands of youngsters in this classification that have to go without.

There is an incredible amount of junk on the market today designed to snare just this type of modeler with his pitiful sum. The great majority of such kits wind up in the waste can—unfinished. This junk can serve no other purpose than to confuse and disgust many would-be modelers.

Even in the best kits for this group, instructions for building are not direct and to the point. The language and terms often are foreign to the modeler. Small and intricate parts are often included that are not necessary. These kits were designed in this way to enhance the beauty of the finished model, but their purpose is too often defeated by confusing the builder and increasing the building time. The plans by which he must work are too often cluttered up with words, numbers, and diagrams in the construction area that add further confusion. To further complicate things, the balsa strips are in too many cases anything but adequate quality, and, in the case of prefabs, you will find parts not labeled, poorly cut with ragged edges, or not clean through the sheet which causes spoilage by unskilled hands.

Here are some suggestions for improving this situation:

1. Keep instructions to a minimum, simple and clear enough for a child to understand. Leave aeronautical terms out of the instructions unless they are clearly indicated on the plans; then hold these to a minimum. These instructions should be printed on a separate sheet so as not to clutter up the building area.

The builder should be shown in a clear, simple, methodical manner, step by step, how the model should be put together, remembering that a great host of these youngsters have never come in contact with a model airplane kit before this. Then, too, it is a fact that children through 13 years of age have difficulty following very simple written instructions, without the aid of personal guidance. In the majority of cases, they will be working on their own, and this should be taken into consideration.

2. Keep parts and fittings to an absolute minimum. Nothing dismays the beginner more than to spread his kit out and find a great assortment of intricate parts that must be put together, especially if they are not labeled. He is thwarted by parts that are not cut clean, or cut to improper size.

A well engineered kit would allow a maximum number of errors on the builder's part so that the finished product will give him a fairly good degree of satisfaction, at least to the point of having the desire of tackling another. Every part that can be practically eliminated will further this end. This can be done and still retain a fair degree of realism. To see the plane fly is the thing. This will more than excuse the absence of pure realism, which can come at a later stage. In other words, the kit should be rational to this builder from start to finish, all parts fitting in their proper place without any "cute" tricks for getting them there.

3. Don't clutter up plans with unnecessary wording and specifications, especially in the building area. The plans should show clearly which part should go in any given area, without a great deal of wording. Clear, exploded views are good, and should be used to further clarify the position of various parts. The same applies to clear perspectives.

The use of hidden lines broken lines, or fragments should be avoided. The beginner will appreciate these later on, as the models become more complex, and the need for them will become necessary. It must be remembered that he also is learning to read drawings.

The method of placement of fittings, such as landing gears, tail skids, hooks, dowels, etc., should be carefully planned. The builder should be able to clearly understand their position on the finished model, and how they are secured. It may be necessary to become unorthodox in this respect, in order to simplify this procedure. There are many "cute" ways of doing these, but these methods should be left for those in the advanced stage.

4. The quality of materials in the beginners' kits should be excellent. An extra strip or two in many cases would prove a blessing to him, for too often he has too little to start with. Consequently, if one strip is broken, he will have a replacement. He will learn to keep a supply of different wood sizes as he progresses in his modeling.

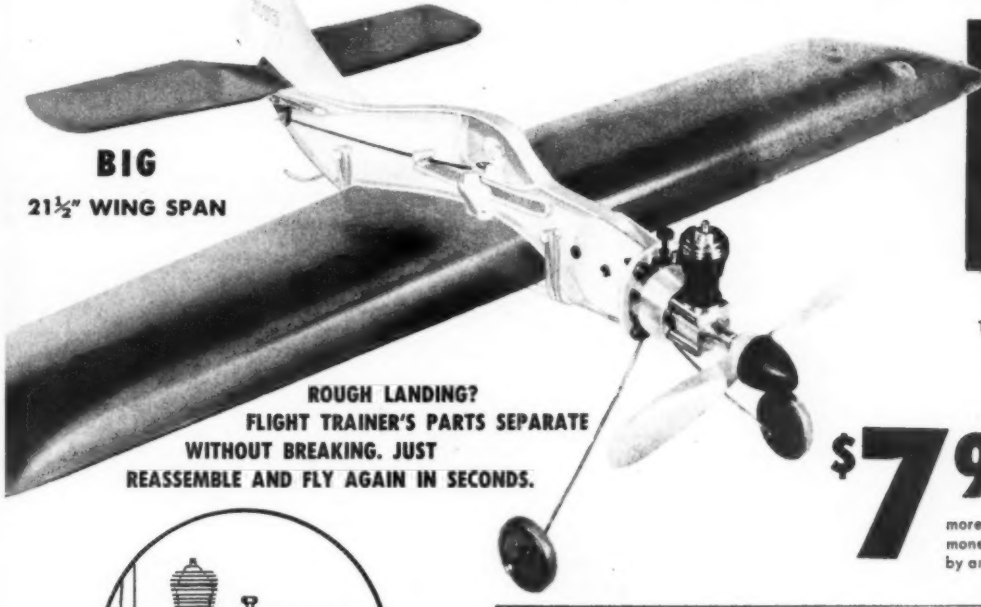
(*Continued on page 52*)

REVOLUTIONARY!

Want to get Dad in on the act? Show him this ad.

Thimble-Drome FLIGHT TRAINER

Now every modeler . . . from Junior to Pop to Grandad . . . can LEARN TO FLY better, quicker, *economically*. No hours of tedious construction only to see your precious handiwork wrecked in an early flight . . . no beautiful plastic job ballooning out of control and into a hazardous nose-dive! Now with *adjustable* thrust angle and other exclusive training plane features, FLIGHT TRAINER avoids those costly crackups, carries the beginner confidently from first flights up to and including stunt flying! It's the first plane specifically designed to TEACH the art of model flying! Get over to your dealer as soon as possible and see every detail, including the big wing area and unique *re-assembly* feature developed by Thimble Drome engineers



BIG
21½" WING SPAN

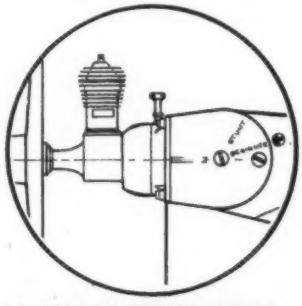
No screws—no glue. Plane is held securely together by rubber bands! Shock absorbing prop spinner even cushions nose-in landings. Entire plane constructed of new type almost indestructible plastic.

Equipped with all new Thimble Drome Babe Bee engine—powerful, INSTANT STARTING.

ROUGH LANDING? FLIGHT TRAINER'S PARTS SEPARATE WITHOUT BREAKING. JUST REASSEMBLE AND FLY AGAIN IN SECONDS.

$7.95

more airplane for the money than ever offered by anyone.



ADJUSTABLE ENGINE MOUNT

NEW! Calibrated engine mounting. Permits adjustment of engine from down thrust (for slow stable flight) to the required upthrust for stunt maneuvers such as wing-overs, loops, dives, etc. A new all-in-one flying thrill!

It isn't "as good as a Cox" unless it's made by

Power your plane, boat, and race car with a new
Thimble-Drome **babe bee .049**

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Designed for best performance with Thimble-Drome Fuel.

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A completely NEW engine, with NEW features ...13 months in development... extremely easy starting...right or left hand rotation; all metal tank and carburetor unit; rear top needle valve position; right, left or bottom fuel pick up; no outside fuel lines; easily connected to timer or special tanks; on plane installation no holes necessary in fire wall.

See your dealer for complete line of World's Champion Thimble Drome Engines from $3.95 to $6.95.

L. M. COX Mfg. Co., Inc. SANTA ANA, CALIFORNIA

5. These kits should be so engineered that the modeler can do as much of the constructing on each one as he can reasonably accomplish. "Quickies" are not really satisfying, and give the modeler very little chance of learning actual construction methods.

We need to supplement what we are doing with field activities, contests, advanced instruction in such things as flight theory and design, and laboratory work that will tie in model aviation with the real thing. These boys do not need to limit their activity to classes, for they can participate in contests or informal weekend flying sessions in U-control, free-flight, and radio control.

No one is more appreciative than a boy who knows you are truly interested in him. And this alone well repays the time and effort in a program like ours.

MAN at Work

(*Continued from page 7*)

a glider with bamboo ribs and silk covering. Though stable as expected, it also had the characteristic high sinking speed of the Zanonia. Nothing new!

• • •

► San Antonio Gas Model Airplane Association (Bill Dawson, 1924 W. Huisache Ave.), sent a team to a Mexican contest at Monterey, taking six firsts, five seconds, and the Governor's Trophy. Then, feeling their oats, tackled the Austin Aeromodeleers, who got revenge for a previous beating. Those Mexican boys built the world's prettiest finished airplanes. Any arguments? . . . Greater Hartford Model Plane Club, (Joseph Greene, 1746 Main St., Glastonbury, Conn.) has 15 members flying everything from speed to radio. Looking for members. Meetings rotate between homes . . . From Tony Becker, Philadelphia Model Aeroplane Association, 1625 Spruce St., news of four indoor record trails at Lakehurst, N. J. You can still make August 5, September 9 and 23 dates. Second Annual Indoor Model contest, sponsored by the Association, at National Guard Armory, Broad and Diamond Sts., Philly., drew 9 members. Indoor models are far from dead—just give 'em a break. Newspapers, radio, even TV covered. Tony, incidentally, is the first guy we know of to make one of the new monster FAI jobs for 1957. His condition is given as "Fair." . . . if you want copy of the New Jetex rules, write American Telasco, 166 Spring Road, Huntington, N. Y., and say we sent you.

Draggin'

(*Continued from page 18*)

this didn't prove to be worth the trouble and weight so it was discarded in favor of the more conventional type shown on the plan. The addition of a hardwood center spar, moving the engine closer to the center of gravity, and channeling the exhaust through the bottom of the cowl rather than out the sides were other improvements.

Construction should begin by cutting out of all sheet parts. The wing is assembled first (joke). Lay down the trailing edge and bottom of mainspar on the plan, and cement in ribs 2 through 9 and "W" pieces. Since there is no curvature in the ribs aft of the mainspar, the trailing edge and spar do not need to be blocked up. It is necessary to slip the center spar in at this time. The fuselage side assemblies, consisting of the engine bearers, plywood doublers, "Y" pieces, and ribs, (number 1) are constructed, bolted to the engine (in order to do this while wing is still pinned to plan, engine is installed right-side-up until ce-

ment has dried), and cemented to wing. The vertical webbing of the I-beam in the center between the number 1 ribs is now inserted. Next the I-beam top piece, leading edge (first the top, and then the bottom), and "Z" pieces are added. Elevators and control system are now installed. It is important that the control setup be no more sensitive than the one shown on the plans, and that any looseness be eliminated. With the additions of tips and skids the wing is completed.

The fuselage is begun by adding the lower front cowl block and ¼" sheet bottom. These pieces are hollowed just enough to allow the engine to be installed and then the top block is spot cemented on. Note that the cylinder head juts out the cowl bottom, there should be 1/16" clearance between the head and the balsa. Now carve to shape using the side view, spinner, and cross-sections as a guide. The fin is constructed from two pieces of 1/16" sheet which are bent slightly to conform to cross-section "C" at the front. The rear edges are beveled and cemented together. Paper clips are helpful at this point. When cementing the fin remember to warp in about ¼" outward rudder.

Remove the top fuselage section, hollow the cowlings, cut the intake and tank vent holes, and install the cowl hold-down parts. The front hold-down clip is cemented to the top, and when it has dried it is inserted into the pieces of fuel line. The pieces of fuel line are cemented to the cowl bottom with the clip inserted, to insure correct alignment. This cowl hold-down system has been used on several models; it's secure, yet allows quick removal.

The completed framework should be sanded, given a coat of clear dope. The wing is covered with Silkspan or silk and

given four coats of clear dope. The canopy former and canopy are cemented in place, then the fuselage is given three coats of sanding sealer and sanded with #320 or #400 paper. Several coats of dope should be applied to the cowl interior. A couple of coats of color dope, and a trim job complete your *Draggin'*. Fuel-proof dope is used throughout.

This is a frisky *Draggin'* so go easy on the first flight. Line length should be 25 to 35 feet, the shorter lines to be used on breezy days. For most .049 engines a 6-3 prop is best. Inexperienced flyers and those desiring more of a sport-type performance may want to tame their *Draggin'* by removing a ⅜" wide strip from the T.E. of the elevators.

Have fun!

Ascender

(*Continued from page 27*)

ing and trailing edges are built up from strips piled one on top of the other (not one in front of the other). To obviate a lot of trimming, the tapering is accomplished by simply using more strips toward the center. Use slow drying cement and amply overlap each balsa joint. After the leading and trailing edges and the tips are pinned in place, the bottom cap strips (⅛ x 1/16") are installed. Put the spars in place, building them up as indicated on the plan. Cut 26 identical ribs (no notches yet) from soft 1/32" sheet. The rib tapering is done by trimming the back to the desired length, placing a straightedge from the bottom of the leading edge to the top of the trailing edge, and slicing off the extra wood on the bottom. In other words, the tapering is done by removing a small triangle from the bottom of each rib. Since the top and bottom of each rib are cap stripped with ⅛ x 1/16" and the trailing edge is ⅛" thick, the ribs come to a point at the trailing edge joint. Make the center rib from medium ⅛" sheet.

Cut the spar notches and assemble. Add the top cap strips. Since the spoiler must be formed to fit dihedral contour, the door is sanded from soft ¼" sheet. Install the air timer and DT fittings. A tiny mousetrap type spring kicks the spoiler open. A short length of fishline limits the opening.

FUSELAGE AND TAIL: Cut the round formers as shown and assemble them with four strips of ⅛" sq. to form a shell fuselage. Commence planking with 1/16" x ⅛" strips, adding one to each side in turn. An alternate construction method is to cut the formers in half and assemble the fuselage in two shells (right and left). By pinning the fuselage halves to the work board while planking, you can be certain of absolute straightness.

The pylon is cut from ⅛" sheet. Be sure to build ¼" incidence into the pylon. The engine mounting nuts are soldered to a small brass plate which is cemented behind the firewall. Reinforce the firewall joint and wing hooks with gauze. The jack-knife gear is made from a hard piece of ⅛ x ¼" balsa. Leave it long; it can be trimmed later. Add the rudder and subrudder.

The stabilizer outline is laid out from soft balsa. The split ribs are made by simply laying a piece of ⅛ x 1/16" down for the bottom and slicing 1/16" thick rib sections for the top by making a template of the top airfoil curve and slicing out 14 ribs from ⅛" sheet. After the spar is cemented in place, the rib tops are simply cut to length at the back and cemented. Sand the stabilizer, cement it to the fuselage, and add another rib top at each side of the fuselage-stabilizer joint to make a

smooth fillet. The stab tab is made from thin aluminum. The adjustment device is a 2-56 bolt with two nuts. Make the tail from soft wood and try to save weight wherever possible at the rear of the fuselage.

FINISHING: The model is covered with tissue and given two or three thin coats of dope, followed by fuel proofer around the front. Since the spoiler interferes with normal wing fastenings, the wing is held on with small bands looped around projecting wing wires. Make these from .040 wire and cover the cement joints with gauze.

FLYING: Since this is a large model for 1/2A, you will need a very good engine for best performance. We use a wing drag-tab for glide turn. Our model climbs straight with a slight right circle. As the engine speed is gradually increased during testing, the stabilizer tab can be adjusted down to keep the climb at a fast shallow angle. To keep the ship from stalling in the glide use a tight circle. Don't forget to adjust the spoiler from a minimum opening to a larger opening. The spoiler is more effective than you think. After 75 flights our model weighs 5.9 ounces.

Radio Control News

(*Continued from page 24*)

If a relay refuses to drop out after the reed stops vibrating, or if the relay closes and stays closed when the ON-OFF switch is closed, a bad transistor is most likely the cause. For satisfactory operation with a wide variety of transistors, a GEM 5000 ohm relay is recommended by Mr. Cutler. Do not have the relay drop out at less than .8ma and keep the transistors away from engine or other excess heat, since they are temperature-sensistive devices. We have tried this system and have found it to work exceedingly well, even with transistors that were discarded for other purposes. A negligible amount of current will flow in the transistor even when the reeds are not in operation. However, the extremely small amount more than compensates for the added reliability obtained with this system.

A photo shows Urban Rosenqvist of Rokbro, Sweden, with his Acrobat made from MAN plans. Powered by a German Webra 2.5 diesel, this RC model uses our two tube receiver, which Urban states is quite popular around the Stockholm area. The first RC contest was held at Upsala, Sweden, on May 6th.

Frank Baker, 1414—3½ Street, Rochester, Minn., the flying scale man from the Land of Lakes country, states that the majority of flyers in his area are using vibrator power supplies instead of batteries, to power their transmitters. A little rummaging around in radio repair shops will probably turn up old 'farm type' radios, which employed a vibrator type of supply. Freedom from rapidly falling voltages and the replacement cost for B batteries are the main features of this type of power source. With the transistor power converter for receiver use, as given in last month's column (B & S Products Co., Mercer Island, Wash.), it looks like B batteries may become a thing of the past. The Rochester group use a two-tube transmitter employing a 6AU7 and 6AQ5 tube, fed by a 250 volt power supply. Sounds good, as long as they stay within the 5 watt input to the final stage.

FCC registrations are being sent in at a better rate than they were 6 months ago, but there is still room for improvement if we are to get new bands or frequencies in which to operate. Another frequency or two would really put some life into

RC work—anyone for a dogfight or Thompson Trophy race?

RC fans around Altus, Okla., should contact Jerry B. Patterson of 913 Park Avenue, Altus, regarding the formation of a flying group. Although there are but three active RC flyers in that area, the bug has bitten the U-control boys, so business may pick up. Anyone having films of RC events, or can furnish information as to where the Altus Dustbusters can obtain them for a club showing, should contact Jerry. Sixteen mm is preferred. They claim unlimited acreage and a WW II flying field for RC flying.

Another photo shows a group of Dutch flyers, as sent in by E. Kreulen, Binnenweg, Rotterdam, Holland. The ships show very good proportions and since this picture was taken in 1953, it speaks very well for the design ability of the Dutch modeler. Also from Mr. Kreulen, is a picture of an ED 5cc Diesel fitted with a special air-and-fuel-intake control. Another way in which the same effect, that of smooth control, may be achieved, is to have two fuel tanks and two spray bars. One of the fuel tanks contains 'hot' fuel and the other one a normal fuel. The more we think about it, the more we think the old ignition engine had a lot of good points.

We hope the California boys will forgive us for picking a bit of information from the April issue of The Radio Controllers News Letter, published by the Larks. There was just too much good info which we think will interest other RC'ers around the country. First of all, we'd like to be around when the 6½ foot Northrop A-17 attack bomber is flown with multi-channel equipment by Lee Hamlyn.

You can't collect insurance if you don't abide by the rules, as attested by Doc Hauk who crash-landed his RC job on the hood of a '56 Chevvy. Howard Bonner has been having good luck with his 5-pound ship, controlled by the CG 5-channel unit. Does inverted flying too.

Ever wondered how to reduce your wing loading? A simple thing to do is to increase the wing area. This is shown in a drawing of a Live Wire Cruiser with a lower wing attached. On the Cruiser, the lower wing is 48" span, 9" chord and has no dihedral. This type of conversion is really catching on out on the coast.

Dr. Murray L. Rich, 1064 Lawton Road, Park Hills, Covington, Ky., sent in photo of his Lazy Bones, plans of which were in the December 1954 MAN. Control is by a single-channel Babcock unit and the proportional rudder uses an Adams actuator. The Fox 29, driving an 11-5 prop, really puts this 7-pound plane through its paces. Dr. Rich stated that he hadn't seen any mention of this plane since the plans were given. Actually, quite a few builders have built and flown it, and it has proven to be a very able flyer.

A member of the Chicagoland Radio Control Modelers, Frank Madl, 2506 Newcastle Avenue, Chicago 35, Ill., sent in photos of his super, modified 9-foot Cavalier. This light cream and maroon creation weighs 14 pounds and is powered by an Orwick 65, swinging a 14" prop. Fibreglas is used to cover the front end of the fuselage and the inside of the nose section. Fifteen years of experience went into this design which features dihedral in the stab, square wing tips with washout and the CG at 50% of the chord. The first test flight showed an increase in speed and stability over earlier designs. The radio gear consists of Frank's own transmitter based on the Rockwood unit, and his version of the popular Bramco reed re-

ceiver, using GEM auxiliary relays. This equipment, operating on 50-54mc gives rudder, elevator, motor speed and motor cut-off control. Oh yes, the chute. This is a 9-foot nylon job, weighing 8 ounces and stressed for 60 MPH, allowing a drop at the rate of 10 feet per second with a 14 pound load. So far the chute has not been given a flight test since Frank is working on a smaller version.

Ben Bacon, 2801 Penick Street, Shreveport, La. (Badaco Mfg. Co.), is willing to send FCC registration forms to anyone requesting them. He feels that if more flyers do not send in their registration, the situation could become serious. OK, here is an out for those who say they don't know where to get forms. As to flying in the Bayou country, they use everything from our two-tuber to 5- and 6-channel Badaco equipment (Badaco 5-channel). Standard Live-Wires, Mambos and Kittens are flown, in addition to scale Piper J-3's, Piper Tri-Pacer's and other scale jobs.

Bob Hardesty, of the Wichita RC Club, 633 S. Estelle, Wichita, Kan., has furnished information on their AMA sanctioned RC contest, to be held at the old Strother Air Base, Wingfield, Kan., (50 miles south of Wichita). Unlimited space and paved runways for take-offs and spot landings. Rudder-only and multi-channel events will provide trophies for the first place winners, with plenty of valuable prizes for runners-up. Contestants may enter BOTH events provided they have two separate planes.

We'd like to report that single-channel events are becoming more popular and quite a few contests are being run with three events instead of two. These being rudder-only, single-channel, and multi-channel. We've pushed single-channel operation from the very first and it looks like a lot of you agree that we need it.

NEWS ITEMS

Badaco Manufacturing Company of Shreveport, La., announces that they have transistorized a series of multi-channel receivers. The 5-channel unit weighs about 6 ounces, less batteries and case, and the 3-channel set weighs in at about 4 ounces. Filament drain is but 40 ma and the relay stages have a 3.5 ma current change. The main feature of this unit is that it contains a built-in voltage regulator which provides for excellent tone stability over a wide range of B-battery voltage fluctuation. This means that over 15 flights may be made without retuning, a big improvement over older units. It looks like reeds are making a strong comeback merely because the manufacturers have attacked the problem at the source, in this case poor tone stability at the transmitter.

After using the audio checker we mentioned in the July column, it was decided to see what could be done about building up the audio output signal. This would allow the monitor to be placed about 50 feet away and still hear it as you operated the transmitter. This was done by using a sub-miniature PM speaker coupled to the CG Electronics receiver. Lafayette Radio, 100 Sixth Avenue, N.Y.C., has this $1.95 speaker. Since the speaker has a coil impedence of 10 ohms, the matching transformer designed for this speaker was used. With audio work making rapid strides in RC work, this speaker should find a spot in someone's design.

Polk's Modelcraft Hobbies, 314 Fifth Avenue, New York, N. Y., is out with a new MOPA transmitter utilizing a printed circuit. This hand-held unit comes in kit form for only $14.95, and completely assembled, less batteries, for about $19.00. Range checks have been exceptional for a

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- ☐ EQUALIZER: Multi-control RC. Nov. '55
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- ☐ BOOMER: Free flight pusher. July '55
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hand-held unit and since it is of the MOPA design, it may be readily modulated. If you're looking for self-neutralizing actuator, they also have a new ED unit which may be set to give a trimmable position. This $14.95 unit may be hooked up for use with single channel or multi-channel receivers. We use ours to turn the outboard motor of an RC boat. Polk's also stock the new Mallory mercury cell B batteries. Available in the same voltages and physical sizes as the regular type of hearing aid battery, these units have the advantage of being capable of supplying a higher current. They will supply 8 to 10 ma for very short periods of time and will supply 4 to 6 ma steady drain for normal use. The weight is slightly more than the conventional 'dry type' battery.

Since you spend good money to build a receiver, you should protect it. Lafayette Radio, 100 Sixth Avenue, New York, N. Y., has a variety of clear plastic boxes that are ideal for this use. Also, they are just the thing from which to make transparent relay enclosures. For those hard-to-locate RC components, we suggest you send for the Lafayette catalog T4-56. This catalog contains an extensive listing of various transistors, sub-miniature transformers, small high capacity capacitors, and many other items used by the RC builder.

Although it has been mentioned before in NEWS ITEMS, we still get inquiries from builders who want to know how to get that 'professional' look when building a transmitter or cased receiver. It all points to the type of finish used and how much care is taken in adding details. You, too, can add a wrinkle or hammertone finish to your equipment by using the materials marketed by General Cement Co., or Walsco, and available at your radio supply dealer. This paint comes in a spray can and only a warm oven is needed to make your equipment look like it came right off the dealer's shelf.

Very often this column carries information on items, which at the time are either too advanced, or for which there is little or no need. Such is the case of the Mitron RS-1 receiver and the K-2 second channel unit. Marketed by the Mitron Radio Company, Box 213, Circle, Mont., the receiver measures 1⅝" x 1⅝" x 2½", weighs about 2 ounces, less relay and batteries, and uses an Rk-61 and one of several hard tubes. The second channel unit is very compact, occupying about 1 cubic inch of space and utilizing one of several hard tubes. Now that single-channel events are coming into their own, here is a receiver setup which allows a beginner to start with a basic unit and then add to it as he progresses. We are using our unit in an RC

boat. And here we'd like to mention that no item is written up in this column unless it has been tested and placed in actual field operation.

HELP: Some manufacturer sent us a new engine speed-control unit. It looks nice, it works, and we'd like to say something about it. Why can't we? Because the manufacturer forgot to send his address (He has nothing on the readers—Editor) or a data sheet with it.

About the German Standard 20 transmitter, sold by the Wilshire Model Center of Santa Monica, Calif.: this is the companion to the unusual German receiver we mentioned last month. The price is about $29.00, and this includes the built-in meter. Another thing to look forward to from the Wilshire Model Center in a few months is a German kit to build the remarkable receiver as described last month. Incidentally, the Electra plane, plans for which may be obtained from this shop, is a fine flying and rugged model of German design.

Marine Engines Reviewed

(*Continued from page* 17)

posed by attention to porting and port timing. In general, the process adopted appears to have been to retain gas passage and port areas of reasonable size in order to maintain a reasonable brake, mean effective pressure over the most useful speed range, but to provide a fairly quick cut off to timing which causes a sudden and rapid drop in b.m.e.p. beyond a certain point.

The type of power curve produced by such a setup is a smooth climb to a peak output in the region of 12,000 rpm, followed by a rapid decline in power which limits the maximum attainable speed under flywheel load to, perhaps, 15,000 rpm. Characteristic of such a layout is the rotary-valve timing (in which the valve closes about 25 degrees earlier than in the average rotary-vale two-cycle miniature motor) also the wide, but relatively shallow, cylinder port openings. (The effective area of the cylinder intake port on the Cameron, it should be noted, is only a little more than half the depth of the actual port, which is so cut, presumably, to avoid an excessively abrupt entry from the bypass.) No sub-piston supplementary air induction is used.

The Cameron weighs nearly 4¾ oz. which, for a .09, is clearly double that of an equivalent aircraft motor, and to which is added a further 5 oz. for the flywheel. It is also available in a two-speed version, a point of interest to RC enthusiasts as the engine is particularly well suited to the enclosed RC cabin-cruiser type installation.

Somewhat different is Cheminol's O&R 29 Marine, which is three times the displacement of the Cameron and is more suitable for fast hydroplane installations in which regular air cooling is obtainable. The engine is based on the original Ohlsson & Rice 29 aircraft unit and features the well-known O&R spot-welded type of construction. The most noteworthy departure from aircraft practice in this engine is the flywheel and drive arrangement. Drive is taken, in the normal way from what would be the front of the engine (aft end in a boat, of course) while the flywheel is mounted at the forward end on a separate shaft coupled via the crankpin. Both roller and bronze bush shaft bearings are used. The arrangement has the merit of providing a lower installation line and of simplifying starting operations by eliminating the necessity of threading the starter cord beneath a prop-shaft coupling.

Cheminol's answer to the difficult tech-

nical problems of small, light and fast inboard power boats, is its O&R Mariner engine, with matched boat hardware ready to install in any hull. As in full size inboard, boats models can, if properly fitted out, be beautiful in appearance as well as performance.

Of .049 displacement, this powerplant has an integral universal key coupling in the back of the engine into which the shaft fits with no alteration necessary and no chance of shaft wobble. The propeller shaft is made to popular length and the propeller is swaged on at the factory—always a bad problem for the modeler.

The propeller is exactly the right blade area for the hot .049 Mariner and is actually true pitch from hub to tip. This is the only true pitch marine propeller on the market, claims the manufacturer. The true pitch partly accounts for the efficient performance of the Mariner with its installation accessories. The shaft strut and stuffing box are for 12° shaft angle, which is standard for full size boats. The rudder is just right in blade area for this propeller installation and power, and has a bushing with neoprene packing at the top for water seal and to hold setting.

One of the knottiest problems of water cooled engines in boats is the scooping up of water for the engine. The water scoop furnished with the Mariner complete kit is small but has plenty of intake area, thus low resistance.

The propeller, strut, rudder, scoop, and all other bronze accessories are twenty-four karat gold plated for beauty and durability. With the engine is a full scale layout template sheet, showing proper size holes and their locations.

Some of the outer features of the Mariner include a very heavy flywheel, free and clear in the front for easy starter use, and for smooth running.

The Mariner engine has a rear carburetor and so therefore a rear needle valve adjustment—clear of the flywheel and all other interference—operated by flexible cable. Since the Mariner is water cooled, it can be totally enclosed in a ventilated enclosure when fresh air is led from the outside to the intake with the neoprene intake hose furnished.

Biggest news in the model boat world in recent years was the Atwood and the K & B Allyn outboards. No doubt the manfacturers will find ways of improving them but, right now, we can find remarkably little to complain about. Of the two, the Sea-Fury was the first to come into our hands, so we will deal with this first.

Certainly, K & B Allyn seems to have leaned over backwards to make the Sea-Fury look like the real thing. Even the transom clamp looks and works just like the big ones. The only bother we had was in keeping the swivel bracket tight enough to resist movement when starting. This would also cause the boat to wander off course occasionally due to movement through vibration. The remedy would appear to be a bigger diameter pintle on the lower housing and extra swivel bracket screw. However, it now appears that a cure has been effected with the manufacturer's introduction of a gadget called a Turn Selector by which varying degrees of turn can be preset.

Both outboards have been described sufficiently recently in MAN to make a detailed description of their construction unnecessary. It will be recalled that both use Half-A class power heads based on the respective manufacturers' aircraft units, the K & B Allyn, however, using a crankshaft ported for opposite rotation. This motor has a very nice lower housing enclosing a regular right-angle bevel drive to the screw. In each case the power heads have been laid backplate downward and the drive taken from an extended crankpin via special coupling. Flywheels are then mounted on the crankshaft in the normal way.

As outboards are exposed to the air anyway and have a large amount of cold metal in the lower housing through which excess heat can be dissipated. Water cooling is not essential, but the Atwood can be had with this refinement if desired. In this case, a neat two-piece alloy waterjacket is fitted in place of the normal Atwood finned head and barrel. It has an inlet pipe which picks up water, via a rubber tube, from an accurately positioned intake placed 1/8 in. behind the top prop blade, and an outlet at the side. In the aircooled Atwood outboard, the power head is turned through 180 degrees in relation to the lower housing so that the cylinder head faces forward into the airstream. Both models have a bushed main bearing.

The Atwood has a strong transom bracket and a very sturdy swivel clamp which holds the required turn setting under starting and running conditions. Drive to the prop is via a special flexible shaft which runs in channels formed in the split lower housing.

Both outboards are adjustable for rake to compensate for differing transom angles and to allow for planing trim adjustments. Just about everything seems to have been thought of in these two remarkable little jobs.

As might be expected, Atwood and K&B Allyn inboard motors are also produced, the Atwood again being available as a watercooled job. Bill Atwood tells us that demand has been about equal for

(*Continued on page 62*)

ADVERTISING INDEX, AUG. 1956

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FAIRCHILD 24 "RANCHER"

36½" Wingspan

First produced in 1933 as a two-seater, in 1938 was introduced as a four place model using either a radial Warner engine or an in-line Ranger. Military version was known as the YC-61 "Forwarder" by the U.S.A.F. and the "Argus" by the R.A.F. Production resumed for business use after the war. 132 m.p.h.

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watercooled and aircooled types and that no troubles have been experienced with the latter where the boat has a fair turn of speed to provide adequate cooling air. For bigger, slower, radio-controlled boats, especially those where the motor is totally enclosed in a cabin, he recommends the use of the watercooled unit.

The K&B Allyn inboards are, at this writing, only available in aircooled form and so some provision would appear to be desirable to direct sufficient cooling air over the cylinder. Two K&B Allyn inboard models have been produced. One, the Mar-Fury, is basically similar to the Sky-Fury airplane motor. The other, the Sea-Fury Inboard, is an unusual conception, based on the outboard and having a horizontal mounting plate, positioned halfway up the lower housing, which is bolted to the floor of the boat. Like the outboard, it has the merit of eliminating the need for separate propulsion gear. More recently the K & B Allyn firm introduced tandem twin engines in both airplane (Sky Fury Twin) and boat (Sea Fury Outboard Twin) fields, as well as a Twin Inboard marine. Both the latter engine, and the Sea Fury Outboard Twin, are available in displacements of .12 and .15 cu. in.

The biggest marine motors currently available are the Pal units. These consist of an in-line vertical twin and a flat four. Both use a .750 x .625 in. cylinder, so that displacements total .55 and 1.10 cu. in. respectively. They have waterjacketed cylinders, but are otherwise similar to the Pal aircraft motors which we described in our earlier article "Unusual Motors" published in the August 1955 issue of MAN. These motors have carburetor control and will provide all the power likely to be needed for all normal purposes with the biggest model.

To deal briefly with the foreign jobs, most of them, as we have said, are watercooled Diesels adapted from already known aircraft units. The exception is the French Micron of .29 cu. in., which is a specially built spark-ignition watercooled job. It has very long, rigid mounting lugs, a flywheel at the forward end and a starter pulley and drive shaft at the other. It is nearly 5 in. long and weighs 21 oz.

For those interested in high speed work, Germany's well known .15 cu. in. Webra Mach-1 is now put out as a watercooled marine job, or, alternatively, marine conversion sets are available from the manufacturer. Set includes a brass screw-on water jacket and steel flywheel which fits over the existing shaft and prop driver. Conversion outfits for other Webra engines are also available. Something unusual, also German, is offered in the Taifun Marine unit which consists of a watercooled version of the .15 Taifun Rasant ready mounted in a special frame and including flywheel, clutch, prop and shaft.

In the same displacement class are the Dutch Typhoons, available with either plain or ball bearing crankshafts, and having brass flywheels with driving dogs fitted. The Typhoons have a particularly nice four piece machined water-jacket and exhaust manifold assembly which can be quickly taken apart for cleaning. Not so good, on a Diesel, is the rather small diameter starting pulley.

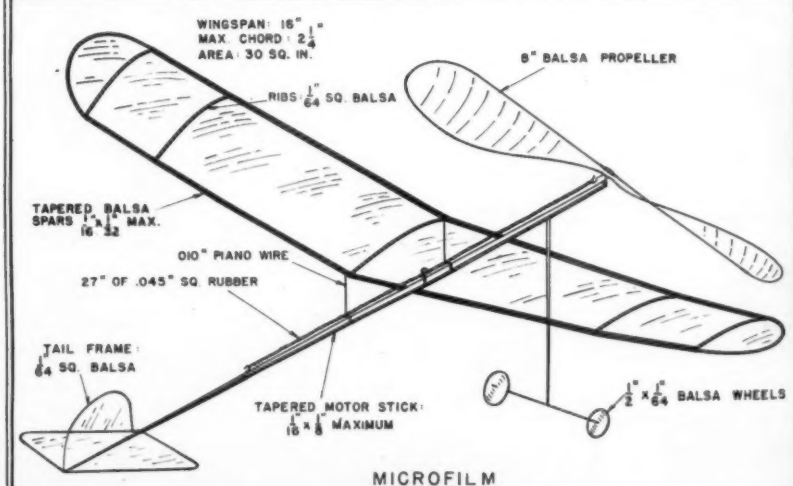
The Italian firm of Micromeccana, producers of the Super-Tigre engines, has brought out the first gas-engined outboard outside the United States. This is the .049 Super-Tigre Outboard. Final drive is via an oil-filled bevel gearbox in a bronze housing. Unit is really rugged, with strong transom mounting and swivel bracket and weighs 6.9 oz. complete. Power head features glow filament.

Finally, there is the quite extensive range of British watercooled models of already well-known Diesels. The .29 Miles Special is the biggest and actually started lite as a marine racing job, putting up some fast times in hydroplane hulls. The .15 cu. in. ED Racer, by the same designer, also makes a very successful marine job, and an engine to watch for high performance will be the reed-valve, ball-bearing Elfin in its three models, marine versions of which have turned brass waterjackets and flywheels.

Most of the Allbon range, including the .03 Dart well-known in the U.S., are now made in marine versions and are very popular among boat enthusiasts in England, as are the low-priced Frog .03 and .09 models which are of a similar pattern.

MODELS THAT MADE HISTORY

BY J. L. MACKENZIE



MICROFILM

MICROFILM WAS INTRODUCED TO MODELDOM BY JEROME KITTEL OF ENGLEWOOD, N. J. IN THE JUNE 1932 ISSUE OF MODEL AIRPLANE NEWS AS A COVERING FOR THIS MODEL. IT HAD FIRST BEEN USED ON MODELS IN 1930 BY ROBERT CLARY, A STUDENT AT M.I.T. HERBERT OWEN OF NEW BRITAIN, CONN. USED A SIMILAR MODEL TO SCORE THE FIRST IMPORTANT WIN WITH MICROFILM BY TAKING THE BABY R.O.G. EVENT AT THE LASTERN STATES INDOOR MEET, NEW YORK CITY, DEC. 29, 1932 WITH A DURATION OF 7 MIN. 29 SEC. BY THE TIME OF THE NATIONALS IN JUNE 1933 ALL INDOOR WINNERS WERE USING IT.

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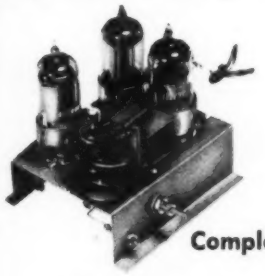

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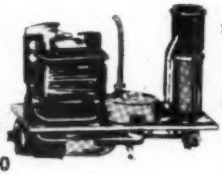

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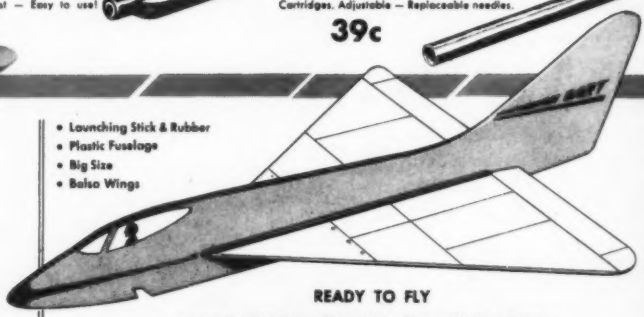

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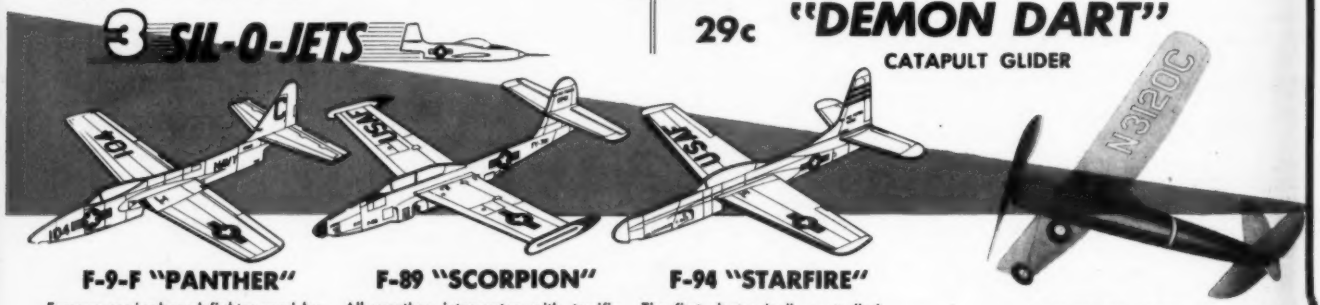

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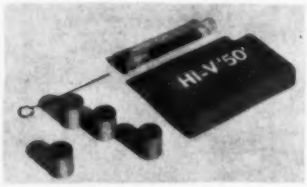

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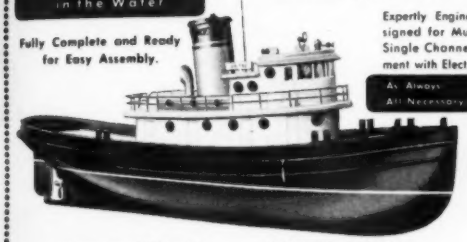

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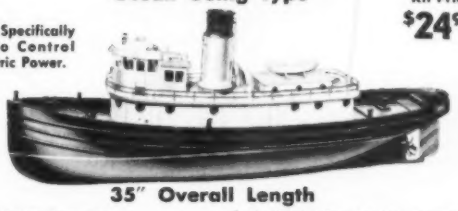

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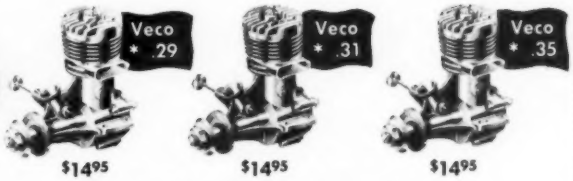

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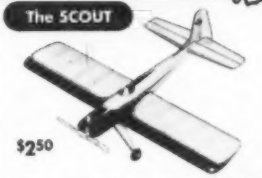

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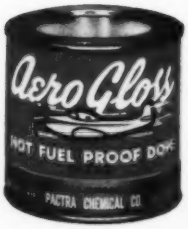

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